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ORIGINAL LECTURES.

THE SURGERY OF THE CENTRAL NERVOUS SYSTEM.

Address before the Medical and Chirurgical Faculty of Maryland, April 24, 1889.

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MR. PRESIDENT AND GENTLEMEN: It has fallen to the lot of my predecessors to record from time to time the many advances in the surgical art which have taken place during the present decade. Under the beneficent influence of antiseptic principles the various cavities of the body have been boldly invaded by the surgeon, and most of the viscera subjected to the operator's knife. It is but repeating an oft-told tale to mention the surpassingly brilliant achievements of abdominal surgery. The dread peritoneum of a few years ago has become the most tractable of all membranes, so that with proper care intra-abdominal operations are attended with a very small mortality indeed. The wonderfulfeat of Lawson Tait, who performed over one hundred and thirty consecutive ovariotomies without a death, stands unparalleled in surgical performances. Operations on the liver, kidneys, stomach, and intestines are followed by most gratifying results. The invasion of the thorax for surgical purposes has become a frequent occurrence; the drainage of the pleural cavity is often performed; the removal of large portions of the thoracic walls for the cure of chronic empyema is successfully undertaken; and even the resection of portions of the pulmonary tissue for neoplastic growths has been safely done. An attempt was made a few years ago by Bloch to resect a lobe of the lung for tuberculosis, but the patient died in twenty-four hours, and the surgeon, chagrined and filled with remorse, terminated his life with his own hand.

Only a few years ago, a celebrated surgeon declared that the limit of operative surgery had probably been reached, but in the short time which has elapsed since this statement was made, some of its most momentous advances have occurred. Amongst all the magnificent achievements of modern medicine and surgery, there is none in which diagnostic acumen and operative dexterity are shown to a greater degree than in the new and but partially explored field of cerebral surgery. I therefore desire to direct your attention to the subject of the surgery of the central nervous system.

By brain surgery I do not mean those cranial injuries which are accompanied with external marks, which serve as guides to direct us to the seat of trouble, but the various intra-cranial affections which make their presence known by signs dependent upon the disturbance in the functions of the parts involved.

Before beginning the consideration of individual lesions, let us briefly call to mind something of the anatomy and physiology of the brain and its coverings. Dr. Keen, at the Congress of American Physicians and Surgeons held in Washington in September, 1888, describes the brain as consisting of a number of viscera, rather than as one organ, and this view simplifies our conception of the brain and its functions very much. The functions of the different portions of the brain have only been partially determined, certain areas are known to preside over certain functions, whilst the functions of other areas are not understood. Marvellous results have followed experimentation upon animals and most of our knowledge of the functions of the brain has been obtained in this way; doubtless increased understanding of the mysteries of this most important structure will yet be obtained by experimentation on animals, by clinical and post-mortem observations, and by the electrical stimulation of the exposed human brain during the performance of surgical operations.

The portions of the brain which are amenable to surgical procedures are chiefly found in the cortex, the base of the brain and its internal ganglia being for the most part inaccessible to operative measures. The frontal lobes, whilst sufficiently accessible, do not always present enough clinical evidence of the pathological condition to justify an operation. As we go backward we come to the motor region which is mostly grouped around the fissure of Rolando, but it involves also the hinder parts of the first and second frontal convolutions, whilst the centre for articulate speech is found in the third frontal convolution on the left side in right-handed persons, in the same convolution on the right side in those who are left-handed. In the pre- and post-Rolandic convolutions and the paracentral lobule we have the centres for voluntary motion; those portions which preside over the motions of the lower extremity occupying the upper, those for the upper extremity, the middle, and those for the head and neck, the lower part of the motor area. The occipital lobes probably preside over vision, and the temporo-sphenoidal lobes are largely concerned in hearing.

Lesions of the cortex of the brain are made manifest by disturbances in the functions of the affected parts, especially in the motor region, where irritative lesions give rise to spasms of the special group of muscles which has its centre at the point of irritation, and destructive lesions produce paralysis of the same set of muscles.

TUMORS OF THE BRAIN.

Tumors of the brain occur more frequently than is suspected by most practitioners, and have been regarded as almost hopeless, until within the last five years. Now the brain has been subjected to surgical treatment, and cerebral tumors are removed with wonderful success. Let us inquire into the nature of brain tumors before

proceeding to consider the propriety of attempting their removal.

The most important investigations into the nature of tumors of the brain have been made by Dr. W. Hale White, of London (*Guy's Hospital Reports*, 1886), who carefully studied the records of 100 brain tumors found in the dead-house of Guy's Hospital from 1872 to 1884. Of these 100 cases of tumor of the brain 45 were tuberculous, 24 gliomatous, 2 glio-sarcomata, 5 carcinomatous, 4 cysts, 1 lymphoma, 1 myxoma, 5 gummata, and 3 undetermined. Of these 100 tumors only 9 could have been removed, provided the diagnosis could have been made, but it is not probable that more than one could have been accurately diagnosed and successfully extirpated. Tuberculous tumors are especially unfavorable for operation, as the disease is usually found to involve other organs as well. Of the forty-five cases in White's list there was not one in which other organs were not involved. Bergmann is opposed to all operations for the removal of tuberculous and gummatus tumors, as the former are almost incapable of being diagnosed, or of being thoroughly removed, whilst the latter require medical rather than surgical treatment. In one case, at least, has Horsley removed a tuberculous tumor of the brain, and Macewen claims to have done the same thing.

The diagnosis of cerebral tumors is frequently very difficult, as in some regions they give rise to no symptoms, whilst in others it is impossible accurately to locate the tumor, though it may be known that a tumor is present. Dr. Seguin says (*American Journal of the Medical Sciences*, Aug. 1888) the diagnosis of a case of supposed cerebral tumor should be worked out in five directions: 1. The diagnosis of a tumor of the brain. 2. The location of the tumor. 3. The depth of the tumor. 4. The solitude or multiplicity of the growth. 5. The nature of the tumor.

First. The diagnosis of a cerebral tumor is usually easily made by an experienced physician, when it gives rise to symptoms, but there may be a tumor without symptoms, especially in the frontal lobes. The most characteristic signs of cerebral tumor are headache, convulsions, local or general paralysis, partial anaesthesia, optic neuritis, hemianopsia, coma, stupor, and slow pulse, which are grouped according to the exact location of the growth. The cranial nerves are liable to be pressed on, and to cause either paralysis or spasms of the muscles which they supply. Aphasia and unsteadiness of the gait are also suggestive of an endo-cranial tumor.

Second. The location of the tumor. As has been said, portions of the cerebrum are very tolerant of pathological lesions, and a tumor affecting these areas may give rise to no localizing symptoms. The frontal lobes, and portions of the temporal, parietal, and occipital lobes, belong to this category. There will be general symptoms of cerebral disease, but no special symptoms. There is left then the central portion of the cerebral cortex, which is known as the "motor area," and which is grouped around the fissure of Rolando. Lesions of this area give rise to symptoms which serve usually to locate accurately the seat of the disease. There are besides certain areas in the occipital lobes, which preside over vision, and a tumor involving this region will cause half vision in both eyes on the side opposite to that in which the tumor is seated. The first temporal gyrus seems to be the organ for

the perception of spoken language. Tumors of the motor zone give rise to symptoms which vary with the seat of the growth, which symptoms are spasms or paresis of the muscles to which the fibres from these zones are distributed.

In order to localize the seat of the tumor there are certain first or "signal symptoms" which must be carefully inquired into and studied; later, as the tumor increases in size and invades surrounding areas, these signal symptoms are obscured by other signs. Suppose a tumor originates in the lower half of the middle portion of the motor area, the first sign would probably be a spasm or paresis of the opposite thumb and fingers, gradually extending to the face and tongue, probably producing aphasia if the left side is involved, and finally terminating in permanent paralysis of the hand and forearm. When the first spasm is limited to a small area the patient retains consciousness and watches the convulsive movement with interest or anxiety. When tumors occupy the sensory zone, their presence is made known by hemianopsia or half vision, if they are situated in the occipital lobes, and by ataxia or staggering gait when the growth presses upon the cerebellum. Dr. Seguin says, "a patient who has headache, vomiting, choked disk, dulness tending to stupor, increasing hemianesthesia, with lateral hemianopsia, without hemispasm or hemiplegia, quite certainly has a tumor in the white substance of the occipital lobe. When with general symptoms of cerebral tumor there is present lateral hemianopsia, as almost the only localizing symptom, there is almost certainly a tumor on the mesial aspect of the occipital lobe, opposite to the dark half fields, compressing and destroying the cuneus." As the tumor grows it may encroach upon the motor area, causing paralysis of the lower extremity, or by downward pressure on the cerebellum may cause ataxia.

Third. The diagnosis of the depth of the tumor. Dr. Seguin stated that the study of lesions of the human cortex and associated fasciculi does not furnish corresponding data for a diagnosis, and that "it is impossible to distinguish a cortical from a subcortical tumor by the character of the convulsions observed." In favor of strictly cortical or epicortical lesions are localized clonic spasms, epileptic attacks beginning as local spasms and followed by paralysis, early appearance of local cranial pain and tenderness, and increased local cranial temperature. In favor of the subcortical location of the tumor are local or hemiparesis, followed by spasms, predominance of tonic spasms, absence, small degree, or late appearance of headache and tenderness to percussion, normal cranial temperature. These symptoms are by no means absolutely diagnostic.

Fourth. The solitude of the tumor. It will usually be possible to diagnose the solitude or multiplicity of cerebral growths, by taking into consideration the character of the growth and the complex of symptoms present. Thus a person with tuberculosis presenting at the same time signs of cerebral tumor, is likely to have more than one secondary focus in the brain. Also when there are tumors in different portions of the brain each growth may cause special localizing symptoms. It is not always possible, however, to diagnose the solitude of the tumor.

Fifth. The nature of the tumor. We may suspect cerebral tumors to be tuberculous, cancerous, or gum-

matous if they occur in persons who have had like diseases in the external parts or in other organs, and in such cases operation is contra-indicated. In other forms of tumor the diagnosis cannot be made. Tuberculous tumors form 23 per cent.; gliomata, 13 per cent.; sarcomata, 13 per cent.; hydatids, 5 per cent.; cysts, 4.6 per cent.; carcinomata, 4 per cent.; gummatata, 3.6 per cent.; with a few of many forms of neoplasm.

CRANIO-CEREBRAL TOPOGRAPHY.

There are various methods of determining the relation of the cranium to the different convolutions and fissures of the brain, but in operating for the removal of tumors a large portion of the skull must be removed, and it is not difficult to expose the growth.

The *fissure of Rolando* is the most important position to locate in operations on the motor area, as from this line we can map out a growth in any part of the motor region of the cortex. This fissure may be found by drawing a line directly backward seven centimetres from the external angular process of the frontal bone, and from the posterior end of this line raising a vertical three centimetres; the upper extremity of this vertical line will correspond to the lower end of the fissure of Rolando. The upper end of the fissure may be found by taking a point five centimetres behind the bregma. The bregma can usually be felt, or can be located by drawing a line through the external auditory meatus at right angles to a horizontal base line drawn from the base of the upper incisor teeth to the base of the occiput.

Reid's method of determining the position of the fissure of Rolando is to erect two verticals, one in front of the ear and the other behind the mastoid process, at right angles to a base line running from the infra-orbital margin through the auditory meatus to the external occipital protuberance. The fissure of Rolando will be represented by an oblique line running from behind forward from the top of the posterior vertical line to about the middle of the anterior line.

Probably the best method of locating the fissure of Rolando is by halving the line from the glabella to the external occipital protuberance; the top of the fissure lies half an inch behind the centre of this line, and in most cases forms an angle of sixty-seven degrees with the sagittal suture. A very useful instrument has been constructed of soft iron, consisting of a long arm one-third of an inch wide and ten inches long, from the middle of which a short arm, six inches in length, branches off at an angle of sixty-seven degrees. When this instrument is properly applied, the short arm lies over the fissure of Rolando.

The *fissure of Sylvius* can be located by a line drawn from a point one and a quarter inches behind the external angular process upward and backward to a point three-quarters of an inch in front of the parietal boss.

Having made the diagnosis of a tumor involving the cerebral cortex, and having determined upon its removal, the growth must be accurately mapped out on the shaven scalp, and the patient prepared for the operation. The day before that of the operation the head is shaved and washed with soft soap and ether, the position of the tumor determined and marked on the scalp, and the head covered with lint soaked in a 1:20 solution of carbolic acid, oiled silk, and cotton-wool, which is allowed

to remain on twenty-four hours. The bowels are moved by a purgative the day before, and by enema on the morning of the operation. Chloroform should be administered in preference to ether, owing to the great cerebral congestion which the latter produces, and it is well to give a hypodermic injection of a quarter grain of morphia previous to the operation, in order to assist in producing contraction of the bloodvessels, and thereby to diminish the hemorrhage. Dr. Keen recommends ergot for the same purpose. Mr. Horsley prefers to follow the full antisepctic details of Listerism in his operations on the brain, but most surgeons are satisfied with the ordinary antisepctic methods.

OPERATIVE TECHNIQUE.—Horsley strongly recommends making a large curved flap instead of the usual cruciate incisions, as the soft parts are more easily held out of the way when the flap is curved. The bone should be removed freely with the large trephine and ronguer, and the buttons carefully preserved in hot, carbolized cloths, in order that reimplantation may be done if it seems desirable to do so. The dura mater should be divided an eighth of an inch from the margins of the opening in the bone, and to the extent of four-fifths of the exposed area. The middle meningeal artery should be secured by a ligature passed through the dura mater before it is divided. Hemorrhage from the pia mater will have to be arrested by ligature of the bleeding vessels, which is also the best method of arresting bleeding from the brain itself, though this is difficult, as the cerebral vessels are very friable, and the ligature must be applied very gently. Upon division of the dura the brain may at once bulge into the cranial opening, if the pressure is great, and the tumor be exposed to palpation and sometimes to sight. At times the surface of the brain is discolored at the seat of the tumor; at other times there is no noticeable pathological condition, the brain appears to be normal, and the tumor is situated deeply in the cerebral substance, and usually can be detected as a hard lump, by palpation.

The tumor may be enucleated by tearing through the intervening brain-tissue with the end of the finger or the handle of a spoon. Even where a large tumor has been removed, the cavity in the brain-substance does not remain long, as its base is rapidly raised up almost to the level of the cranial opening.

Drainage should be made as in any other wound, and a perforated rubber tube may be employed for this purpose. Horsley recommends removing the tube in twenty-four hours, but Weir thinks it may safely be allowed to remain for two or three days. After all oozing has been arrested by gentle pressure with a soft sponge, the dural flap is sutured with fine silk or catgut sutures, and the fragments of bone may be reinserted in position. The scalp is now securely sewn in place, and an antisepctic dressing applied, of iodoform, carbolic acid, or sublimate gauze, according to individual preference. The dressing is quite firmly applied in order to diminish the chances of the formation of a hernia cerebri. There are many details in regard to operative technique and after-treatment which, though worthy of discussion, must be omitted from this report.

DANGERS OF THE OPERATION.

First. Sepsis. The operation must be thoroughly aseptic.

Second. Hemorrhage. This is a very fruitful source of danger, and it is a very troublesome complication. The vessels should be seized with clamps and ligatured, or the clamps may be left in the wound for twenty-four hours or more, an effective antiseptic dressing being applied.

Third. Edema of the brain. This is a complication which frequently follows interference with the brain.

HISTORICAL SKETCH OF THE OPERATION.

In tracing the history of the operation of opening the skull for the removal of a tumor, we see that it is absolutely a production of our own day and generation, since it has only been possible to locate accurately lesions of the brain a very short time. Probably the first operation for the removal of a cerebral tumor was performed by Durante, of Rome, in May, 1884, who removed a tumor as large as an apple, and the patient recovered. The growth was situated in the frontal lobe on the left side, the symptoms being vague: loss of memory and smell, with some displacement of the eyeball, being the most prominent. This operation was reported by Professor Durante at the Ninth International Medical Congress, and had not attracted much notice up to that time.

The first operation which attracted immediate and universal attention was that performed by Mr. Rickman John Godlee, on November 25, 1884, the diagnosis having been made by Dr. J. Hughes Bennett, of a tumor involving the upper third of the fissure of Rolando. The patient died on the twenty-eighth day after the removal of the tumor. This operation is chronologically of the greatest importance, as it demonstrated the feasibility of the operation and supplied valuable information which has since been utilized. Hirschfelder and Morse, of San Francisco, followed with an unsuccessful case.

To Mr. Victor Horsley, of London, is due the marked impetus in regard to the removal of cerebral tumors, his first case having been operated on, on October 9, 1886, with success. Since then operators in England and America have extirpated these tumors, with ever-increasing success. Several cerebellar tumors have also been removed, but as yet no patient has recovered. I do not see, however, why it may not be possible to excise successfully neoplasms of the cerebellum. It is not always easy to tell whether the ataxic symptoms of a case are due to a growth within the cerebellum or to pressure upon the cerebellum by a tumor originating elsewhere. In a case recently under the observation of Prof. Preston and myself, at the Hospital of the Good Samaritan, the cerebellar symptoms were very distinct, but at the autopsy the tumor was found to have its origin in the corpus callosum and to press upon the cerebellum secondarily. This tumor could have been removed without much difficulty if the friends of the patient had not declined an operation.

CYSTS OF THE BRAIN.

Several cases of cystic disease of the brain have been operated upon; some of them with success. The symptoms and operative procedures do not materially differ from those described above in connection with cerebral tumors.

EPILEPSY.

For a long time it has been known that epileptiform seizures are liable to follow injuries to the head, when the cranial lesion presses upon or irritates the cerebral cortex. Many successful operations of trephining for traumatic epilepsy have been performed. My father, Dr. Caleb Winslow, thirty years ago operated on a man for traumatic epilepsy, successfully. When there is a clear history of injury to the head, and pain or epileptic seizures supervene, it is but rational to remove a portion of the calvarium at the seat of injury, and frequently a depressed bit of bone or spicules of bone pressing upon and irritating the meninges and cortex will be found. Sometimes an accumulation of serum or other inflammatory products will be found, and upon its evacuation the epileptic attacks may cease. Of 82 cases of trephining for traumatic epilepsy, collected by Walsham, of London, 48 were permanently cured, 13 improved, 4 not improved, and 17 died; 9 deaths were due to suppurative meningitis.

Spontaneous or idiopathic epilepsy is believed to be due to discharging lesions of the cerebral cortex, as enunciated by J. Hughlings Jackson; and, in inveterate cases after the failure of other therapeutic measures, it is justifiable to expose the brain by trephining and excise the focal centre which appears to be involved. This has been done successfully by Horsley, Keen, Nancrede, MacEwen, Bergmann, and others; but we must remember that medical means should be exhausted before resorting to so serious a procedure. In order to determine what portion should be excised, it is essential that the history of the attacks should be accurately learned, and the patient placed under skilled observation, so that the localizing symptoms may be carefully noted. In this manner it is learned what muscles are primarily affected, and, by the excision of the centre presiding over this group of muscles, the spasms are greatly diminished in frequency and intensity or arrested altogether.

Some very remarkable results have been obtained by Horsley, Keen, and others by the excision of discharging centres. As it is impossible to locate such a small portion of the cerebral cortex as the centre for any one set of muscles, as for example that for the thumb, by any rigid rules, it is necessary to find some means of determining the part to be excised, in order that no more of the brain substance may be removed than is required for the purpose; fortunately, we have a means in the electrical stimulation of the exposed area. The application of a weak faradic current to the discharging centre will cause epileptiform spasms in the group of muscles which are presided over by this centre.

The excision of portions of the cortex for epilepsy is a direct sequence of the recent advances in our knowledge of the anatomy and physiology of the nervous system; and, whilst the future of the operation appears brilliant, caution must be exercised lest unnecessary operations should be performed. We have seen the wonderful results of abdominal surgery, but most of us cannot but believe that operative fervor has caused the sacrifice of barrelsful of ovaries and tubes, which ought to have remained where nature put them.

When a portion of the motor area is excised there is at once a complete paralysis of the muscles which are

in connection with this portion, but, in the course of time, a species of collateral functional activity seems to occur, and most of the paretic muscles recover their power, leaving perhaps a very limited group of muscles permanently paralyzed.

ABSCESS OF THE BRAIN.

Intracranial suppuration following fractures and injuries to the skull is a complication which is well known, and the treatment of which by trephining and drainage has, in numerous instances, been attended with success. Beside the collections of pus which are found at the seat of injury between the bone and dura, or subdural, it is not very infrequent for abscesses to occur in the brain substance, hence the surgeon should not be satisfied with simple trephining in cases which present symptoms of intracranial suppuration. When no pus is found when the button of bone is removed, he should go through the dura, and, if pus is not found, an exploration of the brain with a disinfected director or aspirating needle should be made. If pus is found in the brain, it should be evacuated and the cavity drained. There are also brain abscesses which are either idiopathic or, at least, their causes are not discovered, and these may be submitted to surgical treatment if the diagnosis can be made.

A very important variety of cerebral abscess is that which is consecutive to suppurative inflammation of the middle ear or the mastoid cells, of which numerous cases have been observed, and a number of them successfully operated on. The case of the late Roscoe Conklin is still fresh in our memory. The abscess may result from a septic phlebitis extending from the middle ear to the white substance of the brain, or from an extension of the inflammation to the dura mater. The abscess will probably occur at a point one and one-fourth inches above and the same distance behind the centre of the bony meatus of the ear. Mr. Barker calls attention to the subnormal temperature which is found, especially toward night, in cases of cerebral abscess due to ear disease. The patient takes cognizance of inquiries, but answers with deliberation, and this "sluggish but perfect cerebration" is a symptom of cerebral abscess. Usually, when an abscess is present, the dura bulges into the trephine hole, but does not pulsate. Macewen, in addition to the usual method of operating, scrapes out and disinfects the middle ear, and the disinfection of the frontal sinus should also be carefully attended to in any operation upon the brain in which this cavity is opened, as it prevents the access of air through the nasal cavities and helps to diminish the risk of infection.

INTRACRANIAL HEMORRHAGE.

Hemorrhage from the meningeal or cerebral vessels, as the result of trauma, is also recognized as being within the domain of surgical interference. If there has been a fracture of the skull, and symptoms of compression soon supervene, after a period of consciousness, it is almost certain that an intracranial hemorrhage is taking place, and no surgeon ought to hesitate to penetrate the dura mater, evacuate the blood, search for the bleeding vessel and ligate it. Sometimes, after an injury to the head without fracture, symptoms of compression

gradually supervene, and in this case the skull should be trephined, depending upon focal symptoms to guide one to the seat of hemorrhage. Krönlein, of Zürich, recommends, in cases presenting symptoms of hemorrhage from the middle meningeal artery, without external lesions, that the trephine be first applied about one inch to one and a half inches from the external angular process of the frontal bone, but, if no hematoma is found, to apply the instrument again on the same horizontal line at the point where a vertical line from the posterior border of the mastoid process crosses it. Thiersch, in one case, removed three trephine buttons before the clot was found.

Excellent results have followed trephining closed skulls for hemorrhage, Krönlein saving two out of four cases in what would have been otherwise fatal affections. Several cases have been reported of late trephining for symptoms of compression where the formation of an abscess was suspected, but which proved to be a hematoma, the removal of which was followed by recovery. The chief symptoms of hemorrhage are, 1st, an interval of consciousness after injury; 2d, hemiplegia on the opposite side, frequently with convulsions; 3d, slow and hard pulse; 4th, slow, labored, and stertorous respiration.

SURGERY OF THE SPINAL CORD.

Operations upon the spinal cord are of even more recent development than those upon the brain, and as yet only a very few cases have been reported of the removal of tumors within the spinal canal. As far back as 1882, Dr. Carl Maydl, of Vienna, conceived the project of resecting the whole thickness of the cord, and, after some successful experiments on dogs, actually opened the spinal canal of a man for that purpose, but found the conditions too unfavorable to proceed further. The patient recovered from the operation, but was not improved at all. I consider this one of the boldest surgical conceptions on record, and, as such, worthy of remembrance.

Resection of the vertebral lamina for the purpose of relieving pressure upon the cord resulting from Pott's disease or from traumatism, was first performed by that great surgeon, Dr. William Macewen, of Glasgow, in May, 1883. The first case was one of paraplegia with incontinence of urine and feces, due to a connective-tissue tumor at the seat of angular curvature of the spine. A boy, absolutely paraplegic for eighteen months, was completely cured by resection of the posterior vertebral arch, and removal of the connective-tissue growth at that point. Dr. Macewen has operated on six cases presenting similar symptoms to those of this case, with the result of curing or greatly alleviating four of the cases, with one death, which was possibly hastened by the operation, and one death months after the operation from an extension of the tubercular disease. This is a most interesting field, and one well worthy of careful cultivation.

TUMORS OF THE SPINAL CORD OR MEMBRANES.

Mr. Victor Horsley, a young man, an adept in physiology, pathology, neurology, and surgery, has done more than any other person to create the new department of cerebral surgery, and to him is also due the credit of first successfully removing a tumor from the

spinal dura mater, which, by its pressure on the cord, had produced for four years the most unendurable agony with paralysis. The patient was cured after resection of the third, fourth, fifth, and sixth vertebral arches and incision of the dura mater, when a tumor was found and easily enucleated. Dr. J. B. Deaver, of Philadelphia, is the only American, as far as I am aware, who has operated for the removal of a tumor within the spinal canal. No tumor was found except that due to an osteitis of the vertebrae. The patient died from supposed inhibition of the phrenic nerve, and the case is only mentioned as being of interest in the history of the development of this branch of surgery.

ORIGINAL ARTICLES.

A PRELIMINARY NOTE ON THE USE OF EUCA- LYPTUS IN HEADACHE.

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A BRIEF history of the following cases, where the use of oil of eucalyptus was beneficial in relieving headache of various types after other means had failed, is here put on record in order that others may try this remedy as a therapeutic measure in a class of cases in which it has been used with asserted success,¹ but certainly without extended trial. Our own attention was called to this use of the oil of eucalyptus on account of the markedly beneficial effect in Case I., presently to be described, where it was exhibited to control headache believed to be of malarial origin, quinine having failed. The sudden and surprising improvement which followed its use led us to employ it in other forms of functional headache not due to eye-strain or similar removable cause.

CASE I.²—Susan B., æt. forty-eight, single. Marked history of malaria and rheumatism. Formerly had severe head-pains once in two months, lately violent occipital headache every other day, with zig-zag lines and hallucinations as prodromes, entirely unrelieved by quinine. With the exhibition of five minims of the oil of eucalyptus six times a day the headache completely disappeared. Examination of the eyes revealed slight refraction error, the correction of which did not alleviate the pain.

CASE II.—Mrs. D., æt. thirty-one. Nervous family history, menstruation irregular and too free, headaches grouped about periods, no apparent eye-strain, indiscretion in diet sometimes appears to precipitate headache which is not a hemicrania, but general and mostly occipital and congestive in type. If headache is not due to dyspeptic attack, eucalyptus will usually abort it, one capsule (five minims) four or five times a day. Her plan is first to take

aromatic ammonia and if no relief is afforded then eucalyptus. Antipyrin and cannabis indica gave no relief.

CASE III.—Mrs. T., æt. forty-six. Gouty family history, menopause, headaches for years, mainly in occipital region, congestive in type, any increase of blood in head greatly increases pain, doubtful malarial history, quinine in full doses sometimes lessens attack, salicylate of soda at first gave relief, but caused dyspeptic symptoms, likewise cannabis indica; antipyrin unless given in heroic doses is useless. Patient was placed on rigidly restricted diet, and given five minims of oil of eucalyptus four times a day, with marked benefit. Subsequently the administration of a few doses of the drug sufficed to ward off any severe attack. Eyes were normal, no asthenopia. Patient reports a sister greatly relieved by the same remedy given by another physician at her solicitation.

CASE IV.—Miss L. W., æt. twenty-eight. Right-sided frontal headache. Attacks formerly accompanied by visions, lately has silver rings constantly before eyes. Cannabis indica gave but little relief, eucalyptus gave great relief, headaches much better lately; no malarial history. The eyes revealed results of former granular lids, and the headaches were never in apparent association with eye-strain.

CASE V.—Miss C., æt. twenty-five. Menstrual irregularities. No former severe illness. No history of malaria. Headaches for twenty years, chiefly on left side, bearing no relation to menstruation, congestive and lasting several days. No apparent eye-strain. Iron and arsenic were prescribed for the anaemia and oil of eucalyptus in the event of headache. With the prodromal symptoms of a headache, twenty minims of the drug, served in the belief of the patient to abort the attack.

CASE VI.—Mrs. G., æt. thirty-three. Gouty family history; pelvic peritonitis three years ago; a great sufferer from "hay fever;" frequent attacks of tonsillitis; the patient in girlhood had lived in a malarious district. For years she has been the victim of the most violent occipital headaches of a congestive type, beginning with the feeling of a band in the back of the neck, succeeded by a thumping pain in the occiput which rapidly spreads over the entire cranium and is associated with intense injection of the conjunctiva and swelling of the face. The eyes showed a low grade of hypermetropic astigmatism and 10° of insufficiency of the internal recti. Appropriate glasses were ordered, and prisms for the relief of the muscular defect, with the result of ameliorating the asthenopia, but not materially influencing the headache. A prolonged course of all the usual remedies employed for the relief of headache of a congestive type was ordered, but without any very satisfactory results. Oil of eucalyptus, five minims every four hours, gave great relief even during a paroxysm, but was most efficient when exhibited during a prodromal period, or when taken after such exposure, like cooking, which was always succeeded by a headache. The ability to abort a paroxysm was a marked feature of the medication.

CASE VII.—Miss S., æt. twenty-one. Nervous and with a nervous family history; anaemic and

¹ United States Dispensatory.

² University Medical Magazine, May, 1889.

suffering much from enforced loss of sleep; was subject to violent neuralgic headache uncontrolled by the ordinary remedies and not relieved by treatment of a slight ocular defect. Oil of eucalyptus in five-minim doses produced better results than any other remedy; indeed, while the patient continued its use the headaches were practically absent, although they returned when this was discontinued. There was no history of malaria in this case.

CASE VIII.—Miss L., a plethoric woman, æt. nineteen, the subject of hemorrhoids; slight leucorrhœa and sharp frontal with dull occipital headache brought on by fatigue, by the use of the eyes and often without apparent cause, usually worse in the first few hours of the morning. Both eyes hypermetropic with insufficiency of the external recti of four degrees, the correction of which did not stop the headaches, nor was medication directed to the regulation of the portal circulation followed by relief in this direction. Eucalyptus was the means of producing marked relief. The patient also took strychnia and nitro-muriatic acid. Antipyrin, cannabis indica, and the bromides were not successful.

We have given the histories of these eight cases in which the results are sufficiently definite to stimulate further trial of this remedy. We are employing the drug in a number of cases, in which we are not yet in a position definitely to state the result; in others we know that relief has been afforded. Dr. Weir Mitchell and Dr. Wharton Sinkler, of the Infirmary staff, have employed the drug in like cases with benefit. The latter has used it in three cases with decided relief; in one, in a case of long-standing migraine, it was the sole medicine for five or six weeks. In this case the paroxysms, which were right supraorbital and severe, were materially shortened and the intervals lengthened.

Eucalyptus has been used with asserted success in migraine and other forms of neuralgia as mentioned above. In our experience it appears to be of most service in the headaches of congestive type; in one case where indiscretion in diet precipitated an attack the drug did not appear to be of use, although it relieved other seizures. In this and other of our cases the drug acted more beneficially when given at the very onset of the attack than after full development of the paroxysm, and we would suggest its trial as early as possible in the seizure, especially when there is a long prodromal period. The question has arisen, Are the headaches of a malarial origin that are relieved by this drug, or has it some other mode of action? In the first case the evidence of malaria is undoubted, in none of the other cases is it positive, and in some not at all probable. We intend, in a future paper, to give the results of further trial with the oil of eucalyptus, and hope to be able to state more definitely the type of headache in which the most relief may be anticipated. In two instances our results were entirely negative, in both an organic lesion existed, the one in the alimentary

canal, the other in the ovaries. We have used the drug in one case of ciliary neuralgia without effect and intend to give it trial in other types of neuralgia.

COMPARATIVE RESULTS IN NINETY CASES OF PLEURISY, WITH SPECIAL REFERENCE TO THE DEVELOPMENT OF PHTHISIS PULMONALIS.¹

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HAVING watched for some time the various opinions and discussions upon the question of the tubercular nature of pleurisy and its subsequent development into phthisis, and being struck with the widely varying ideas upon the subject, it occurred to me to make an investigation as to the results of the cases of pleurisy occurring in my father's practice from 1849 to 1879.

While recognizing the impossibility in any such investigation of determining absolutely the tubercular or non-tubercular character of pleurisy, I believed that I might at least be able to draw some practical conclusions from the subsequent history of these cases which would assist us in giving advice to our patients, and, more especially, prevent us from unnecessarily alarming ourselves, our patients, and their friends: a tendency which, I think, needs to be constantly guarded against in our profession, in the practice of which we are continually subjected to the influence of extreme views founded upon theories unsubstantiated by facts.

It may be well here to mention some of the various opinions held by eminent men in different countries as to the nature of pleurisy.

The most extreme views are held by Landouzy, of the Paris Faculty of Medicine, who believes that nearly all cases of pleurisy are tubercular in character, and that the so-called simple pleurisy from "taking cold" is a very rare thing, but that the great majority are the expression of an incipient pulmonary tuberculosis which may appear at any subsequent time, even after an interval of many years. In this opinion he is enthusiastically followed by his pupils, J. R. G. Joannay² and Alois Mayor,³ who give his views in two theses upon this subject.

Germain Sée⁴ believes that three-fourths of all pleurisies are tubercular, and quotes Fiedler, who says that out of 112 pleurisies which were aspirated

¹ Read before the American Climatological Association, June 27, 1889.

² Joannay (J. R. G.). "Du prognostic éloigné de la pleurésie."

Thèse. Paris, 1881, p. 61, No. 230.

³ Mayor (Alois). "De l'avenir des pleurétiques." Thèse. Faculté de Méd. de Par., 1887, No. 181.

⁴ Sée (Germain). Boston Med. and Surg. Journal, March 11, 1886.

21 recovered, 25 died of phthisis, and 66 recovered from the pleurisy, but were found to be victims of other tubercular diseases.

Strümpell¹ speaks of the simple fibrinous or exudative pleurisy as a rare disease, and says that the larger proportion are tubercular, and claims that even if phthisis appears several years later it is probably the result of pleurisy, and that only in comparatively few do the symptoms of acute tuberculosis or chronic phthisis appear as an *immediate* result.

Among those who take more moderate views may be mentioned Chauvet² and Rühle,³ who go only so far as to say that many cases of pleurisy are probably tubercular in character.

Demandre⁴ speaks of the deformity of the chest and development of bronchiectasis, and says that usually with pleurisy comes an interstitial pneumonia, but gives no statistics as to the frequency of subsequent phthisis.

Gerhardt,⁵ in 1879, speaks of pleurisy as often preceding phthisis, but also gives no statistics. Niemeyer⁶ classifies various forms of pleurisy, and is evidently far from the opinion advanced by Landouzy.

Anstie⁷ says: "It is now well established, not merely that pleurisy occurs in phthisis, but that pleurisy can set up true tuberculosis even in previously healthy persons."

Bartholow⁸ speaks of the importance of recognizing pleurisy as a frequent cause of phthisis from causing tubercular deposit.

Loomis,⁹ while recognizing the existence of tubercular pleurisy, is very far from believing that all cases are of tubercular nature, or that they will be followed by phthisis.

Sir Andrew Clark¹⁰ recognized the fact that phthisis is by no means an infrequent sequence of pleurisy, but evidently is far from believing in the tubercular origin of all cases, and in these views he is supported by C. Theodore Williams,¹¹ who, in the second edition of his book on "Pulmonary Consumption," says on page 24: "Not uncommonly the friction sound of dry pleurisy in the supra-clavicular region is the first sign of the presence of

tubercle at the apex of the lung. . . . It is generally noted that the lungs are the first organs affected (in miliary tuberculosis), and it is extremely rare for tubercle to exist in any organ without also being present in the lung." On page 49 he says: "Chronic pleurisy, by crippling the movements of the lungs and thus promoting congestions and exudations, prevents the proper expansion of the alveoli, and thus affords a nidus for the bacillus;" and on page 271: "There are two principal modes of origin of fibrosis (that is, non-tubercular phthisis), firstly, *from attacks of pleurisy*, and pleuro-pneumonia, etc."

F. C. Shattuck,¹ in an article on pleurisy, for the *Reference Handbook of the Medical Sciences*, says: "Whatever views one may hold as to the frequency of primary effusion as an independent disease, it cannot be denied that recovery absolute and permanent is common enough;" and, further on, adds: "In view of the fact that tuberculosis does develop in cases of this class after an interval which may be long, we cannot regard them with quite the same equanimity as we are justified in preserving in cases where rational and physical signs alike disappear."

B. F. Westbrook² and Herman F. Vickery,³ in papers published within the last two years, give results of cases of pleurisy which have subsequently become phthisical, and lay stress upon the importance of watching carefully the convalescence of pleuritis in all cases.

Strongly opposed to the views of Landouzy may be mentioned Theodore Dumin,⁴ of Warsaw, who expresses the greatest astonishment at the former's conclusions, and claims that true tubercular pleurisy, where miliary tubercles begin on the pleura, is a rare disease. He believes, on the other hand, that most pleuritis are the result of pulmonary tubercle, which cannot be detected by physical signs, and that the prognosis of the latter form depends upon the course of the primary disease in the lung, which can be healed; views which seem to me as theoretical and difficult of proof as those he criticises.

A strong practical refutation of Landouzy's views appears in a paper by Blachez,⁵ a man evidently of large practical experience, who scouts the idea of the tubercular origin of all pleuritis, and cites a

¹ Strümpell. *Text-book of Medicine* (translation), p. 244.

² Chauvet. "De la pleurésie précédant le début de la tuberculose pulmonaire." Lyon. méd., 1885. xlix. 111-114.

³ Rühle. Ziemssen's *Handbook of Medicine* (translation), vol. v. p. 500.

⁴ Demandre. "Des conséquences et définitives des épauchements pleurétiques sereux, etc. Rec. de mém. de méd. . . mil., Paris, 1881, xxxvii. p. 537.

⁵ Gerhardt. *Wiener med. Wochenschrift*, No. 40, 1879.

⁶ Niemeyer. *Text-book of Practical Med.*, vol. i. p. 249.

⁷ Anstie: Pepper's *System of Med.*, vol. iii. p. 513.

⁸ Bartholow: Pepper's *System of Med.*, vol. iii. p. 513.

⁹ Loomis: *Practical Medicine*, 1884, p. 186.

¹⁰ Clark (Sir Andrew): *Lancet*, 1885.

¹¹ Williams (C. Theodore): *Pulmonary Consumption*, 1887. P. Blakiston & Son, Philadelphia.

¹ Shattuck (F. C.): *Reference Handbook of Medical Sciences*. "Pleurisy."

² Westbrook (B. F.): "Pleurisy as a Predisposing Cause of Phthisis Pulmonalis." *New York Med. Journ.*, 1888, xlvi. 617.

³ Vickery (H. F.): "Pulmonary Tuberculosis as a Sequel to Ordinary Pleurisy with Effusion." *Med. and Surg. Journ.*, 1887, cxvii. 521.

⁴ Dumin (Theodore): "Observations sur les rapports qui existent entre la pleurésie et la tuberculose." *Gaz. Heb. de Méd.*, Paris, 1887, 2 s. xxiv. 295.

⁵ Blachez: "La nature de la pleurésie." *Gaz. Heb. de Méd.*, Paris, 1886, 2 s. xxiii. 662.

number of cases classed as simple pleurisy which have never in later years developed the least pulmonary trouble. He also makes special mention of an epidemic of "pleurésie à figure," which occurred in the army many years ago, the subjects of which he has kept under supervision since, not a single symptom of pulmonary trouble having appeared in any one of them.

E. Martel,¹ of Saint-Malo, comes to the same conclusion as Blachez, and regards as ridiculous the opinion that nearly every case of pleurisy is tuberculous.

Austin Flint,² in an analysis of 47 cases, states that in 3 the subsequent development of phthisis was probable, although not demonstrated, and in one case only was the occurrence of this disease as a sequel certain.

Of 53 cases reported by Blakiston,³ not one became phthisical during several years after recovery from pleurisy.

Thus we have specimens of the widely varying opinions among different observers.

In obtaining my results I have addressed the following set of printed questions to the patients or their friends, answers having been frequently obtained from physicians, who have known the patients, or from town clerks:

1. Where have you been living since you consulted Dr. Bowditch?
2. What has been your occupation?
3. Has your general health since then been good, bad, or indifferent?
4. Have you been subject to cough since?
5. Have you had any lung trouble since, and if so, how long after you last saw Dr. Bowditch did the cough begin?

Should the patient be no longer living, will the friends kindly answer the following questions?

1. How long after the patient saw Dr. Bowditch did he (or she) die?
2. What was the cause of death?
3. Did the patient recover entirely for any length of time after last consulting Dr. Bowditch?
4. Was he (or she) subject to cough?
5. If lung trouble caused the death, about how long after seeing Dr. Bowditch did the cough begin?

If any reputable physician saw the patient at any time, please give his name and address; and if the physician has removed or died, please state, if you can, what he thought the patient died of.

Although the number of cases in which I have been able to collect satisfactory data is small in comparison to the number addressed, yet considering the lapse of time and the frequent uncertainty of address, I am gratified at having received replies from so many.

In analyzing the cases I have attempted no distinct classification into so-called "dry pleurisies,"

pleurisies with serous effusion and empyemas, but have put them all together, my endeavor having been to cast out every case in which there was the least evidence, upon careful examination, of co-existing pulmonary disease (for we all know that pleurisy is a frequent accompaniment of phthisical trouble).

Le me say, also, that with our knowledge that tubercular disease can arise and be checked never to reappear, I should not be so foolishly illogical as to attempt to prove in any given case of pleurisy that because of the subsequent health of the patient it was, therefore, of non-tubercular character. It would, moreover, be a just criticism to speak of the possibility of preexisting disease of the lung in some of the cases mentioned, even when the most careful examination failed to reveal any such condition.

Any such possible error is only an example of the extreme difficulty of arriving at precise conclusions in such questions.

My aim, therefore, is simply to show, as far as possible, how many of the patients have regained and kept their health and how many have succumbed later to phthisis or other probably tubercular disease.

For the sake of convenience, I have divided the thirty years from 1849 to 1879 into decades.

During the first decade, from 1849 to 1859 inclusive, I have the records of 30 patients.

Of these, 11 are now (1889) living, and have all been well, except one who has been subject to cough since at times; 17 are dead. In 2 the condition today is not known, although in one case phthisical symptoms developed fourteen years after the examination, and is classed accordingly; and the other, seven years after the first illness, showed "perfect percussion note and respiration everywhere."

Of the 17 who died, 12 died of phthisis; 5 died from other causes:

No. 1, of chronic rheumatism thirty-five years later, aged eighty-five.

No. 12, from suicide during melancholia twenty-five years later, aged thirty, in the interval having been in robust health.

No. 14, from angina pectoris five years later aged fifty-eight, having been well in the interval.

No. 16, from "acute gastritis" thirty-one years later, aged sixty-nine, no evidence of pulmonary trouble showing itself, although rather delicate.

No. 3, from "inflammation of the bowels" twenty-two years later, aged forty-one, no apparent pulmonary trouble having been present, although after great privations in army life a cough appeared for some time, and then disappeared entirely.

Adding to the number now living, 11, the 1 whose present condition is unknown, but who seven years after the first examination showed a perfectly normal condition, we have 12 who recovered entirely, or 40 per cent.

¹ Martel (E.): *Gaz. Heb. de M6d.*, 1886, 2 s. xxiii, p. 699.

² Flint (Austin): *Pepper's Hand-book of Medicine*, p. 394.

³ Blakiston: *Ditto*.

Adding to those who died of phthisis, 12, the 1 who developed phthisis fourteen years after the first examination, we have 13, or 43½ per cent.

Died from other causes, 5, or 16½ per cent.

In the second decade, from 1860 to 1869 inclusive, I have records of 19 cases.

Of these, 7 are now living, 5 having been in robust health since, 2 somewhat delicate, but without apparent pulmonary trouble.

12 are dead: 9 have died of phthisis, or have developed symptoms since; 3 have died from other causes. One (No. 32) died from "intermittent fever and chronic diarrhoea contracted in the army" two years later, aged thirty (questionable tubercular trouble). No. 40 died of acute mania twenty-three years later, aged thirty, the intervening period having been one of robust health.

Living = 7, or 36+ per cent.

Dead from phthisis, or with phthisical symptoms now = 9, or 47+ per cent.

Dead from other causes = 3, or 16+ per cent

Of No. 32 it should in fairness be noticed that the question of tubercular trouble in the intestines is raised. If such was the case, the original pleurisy was very possibly tubercular, which would alter the percentage slightly.

In the third decade, from 1870 to 1879 inclusive, I have the records of 41 cases.

Of these, 25 are now living without pulmonary symptoms, of whom 23 have been in good health since; 2 are not robust.

15 are dead: 9 have died from phthisis, and 1 (No. 87) is now phthisical = 10 phthisical; 6 have died from other causes: 3 (Nos. 51, 53, and 61) from heart disease, all over fifty years of age, and from ten to fifteen years after examination; 1 (No. 67) from apoplexy following Bright's disease twelve years later, aged sixty-eight; with apparently perfect health in the interval; 1 (No. 72) from "intestinal obstruction" eleven years later, aged fifty-one, perfectly well before; 1 (No. 76) from "paralysis" three years later, aged fifty-one.

Living without pulmonary symptoms, 25 = 61+ per cent.

Dead from phthisis, or now having symptoms of phthisis, 10 = 24+ per cent.

Dead from other causes, 6 = 14+ per cent.

In comparing the percentage of mortality from phthisis in the cases from 1870 to 1879 inclusive with that of the cases of the first decade, 1849 to 1859, we find the percentage 24 per cent. in the former as against 43½ per cent. in the latter, and against 47+ per cent. in the second decade, from 1860 to 1869 inclusive.

In attempting to explain this difference in percentage we must not lose sight of the fact of the possibility of the development of phthisical symp-

toms later in those of the third decade who now seem perfectly well. In one case reported by Mayor phthisical symptoms did not appear until twenty-four years after the pleuritic attack which occurred during childhood, this being, so far as we know, the longest interval spoken of, the patient, a comparatively young woman, succumbing to pulmonary disease—whether a result, as Mayor would have us believe, of the previous pleurisy, or not, being to my mind most questionable.

The fact remains that long periods of perfect health do occur between the onset of the two diseases, and we must, therefore, take this into account in comparing the later with the earlier decades.

In looking carefully over the tabulations, I find, in the first decade, among the deaths from phthisis, the following points:

1 patient died eighteen years after the pleuritic attack.

3 patients died between ten and fifteen years after the pleuritic attack.

9 patients died in seven years or less after the pleuritic attack.

In the second decade, 1860 to 1869 inclusive:

1 patient died in eighteen years after the pleuritic attack.

2 patients died between ten and fifteen years after the pleuritic attack.

6 patients died under five years after the pleuritic attack.

In the third decade, from 1870 to 1879 inclusive:

1 patient died eleven years after the pleuritic attack.

1 patient died ten years after the pleuritic attack.

7 patients died under seven years after the pleuritic attack.

1 patient, still alive, developed phthisical signs about ten years later than the pleuritic attack.

Thus we see that in the first two decades about two-thirds of those who died of phthisis succumbed in seven years, or less, while about one-third lived from ten to eighteen years after. If we adopt the same ratio for the third decade, we have already passed the period (ten years) during which two-thirds of those who developed phthisis succumbed, and even supposing the possibility of a later appearance of phthisis in the remaining one-third, it still leaves the percentage of mortality from pulmonary disease from ten to fifteen per cent. less than in the previous decades.

Should this result be found similar to others in the future, it would give us ground for believing that modern methods of treatment in these cases are productive of better results than in the past. While not attempting to prove this fact, of course, by such tabulations, and granting that it may be mere coincidence, it is at least worthy of remark,

and certainly points favorably toward the greater attention paid in later years to the after-treatment of pleurisies, by proper expansion of the chest, outdoor exercise, good food, etc.

In connection with the preceding, and as opposed to the extreme views mentioned before, I wish before closing to lay special stress upon this point, viz., that I consider as most unwarrantable the assertion, that because phthisis develops in any subject who, several years before, has had pleurisy, the two diseases in every case are necessarily dependent upon each other, the intervening period having been one of robust health.

As an example, let me cite the following case:

A man, now thirty-eight years of age, eleven years ago developed a sudden acute pleurisy, with effusion on the right side, for which he was aspirated by my father, after which he recovered quickly, but three months later was attacked with similar symptoms on the left side, for which he entered the City Hospital, where the fluid gradually disappeared without aspiration. In a few months he entirely regained his health, and has been perfectly well ever since, pursuing his occupation as conductor on one of the railroads near Boston. I examined him this spring, and found him a man of robust health, of good color, the chest full and well formed, the percussion and auscultation on both sides absolutely perfect without a trace of his former pleuritic trouble.

Now even supposing the possibility of a subsequent development of phthisis in this man, should we be justified in saying that the double-sided pleurisy was the first sign of the pulmonary disease which appears in later years? Most assuredly not, it seems to me; on the other hand, why is it not perfectly possible in such cases that the subsequent pulmonary disease is an independent process arising in precisely the same way as in other cases in which no history of a former pleurisy can be obtained?

This and similar cases where there is a long period of perfect health, make me think that the advocates of the certain connection between the two diseases and of the tubercular nature of all pleurisies are drawing conclusions too hastily.

The results of this investigation show us at least:

First. That whether we can prove absolutely, by such statistics, that all pleurisies are tubercular or not, yet a large percentage of these patients who were afflicted with pleurisy, often in apparently chronic forms, recovered their health and have never had any recurrence of the original trouble nor development of subsequent pulmonary or otherwise tubercular trouble.

Second. That while undoubtedly there are many cases in which an attack of pleurisy is followed within a comparatively short space of time by pulmonary trouble; and, therefore, special care should be taken of the patient during convalescence from

the former disease, yet we are not justified in giving such gloomy prognosis as we should be inclined by accepting the extreme views held by Landouzy and his followers.

To give hope and courage to patient and friends should be the first effort of every physician.

Let us be doubly on our guard then, while looking for the truth, in accepting conclusions founded upon insufficient evidence, lest we run the risk of hindering what we most desire, viz., the recovery of our patients.

REPORT OF TWENTY-FOUR CASES OF ACUTE MILIARY TUBERCULOSIS.¹

BY JOHN C. MUNRO, M.D.,
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THE following analysis of twenty-four cases of acute miliary tuberculosis of the lungs has been made in order to furnish, if possible, some clews toward the detection of a disease that not infrequently bewilders the most careful practitioner. The cases have been taken from the records of the Boston City Hospital, and it is to the courtesy of the members of the staff that I owe the pleasure of presenting this brief consideration. For the use of some valuable private notes made on a number of the patients by Dr. Samuel Delano I feel greatly indebted also.

All the cases were fatal, occurring within the last five years, and only those in which a post-mortem examination was made have been chosen.

The number is too small to attempt to draw percentage conclusions, and some factors, generally considered of importance, have been passed over because of insufficient data.

Fourteen patients were males, with an average age of thirty-eight years, that of the females (not including one child two and a half years old) being only thirty-two years. The oldest, a man, was sixty-five years of age, while eight were between the ages of forty and sixty years. Over half were born on or near our eastern coast; two were negroes.

The majority were ill in February, March, or April; their occupations were of various kinds and apparently had no causative influence.

Only three gave a phthisical family history; in twelve it was not phthisical, while in nine no history could be obtained.

Three-fourths of all the patients had always been well up to the time of the present illness, and although in thirteen cases the autopsy revealed a chronic tuberculosis in addition to the acute miliary process, yet of this group only a single patient had given a history of having suffered from phthisis; in fact, the remainder had always been looked upon as healthy. Even though there was a history of cough for one or

¹ Read before the American Climatological Association, June 24, 1889.

more months in quite two-thirds of the cases, it was noted as being slight, with a muco-purulent expectoration and had excited no alarm except in one instance where several attacks of profuse haemoptysis had occurred. Severe cough was recorded in two cases, but in each it had begun less than a month before admission to the hospital.

Among the exciting causes might be mentioned the following: overwork and exposure in a damp cellar; several weeks of hard drinking, with but little food; partial asphyxiation from drowning; measles, scarlatina, whooping-cough with measles, and vaccination each in one case.

The clinical diagnoses varied considerably, from tubercular meningitis in eight cases, to exhaustion, typhoid, bronchitis, etc. Two patients died immediately after admission to the hospital, so that very little history and no physical examination could be obtained.

About one-third of the cases gave a clear history of a marked chill ushering in the disease; a few more complained of feverishness and malaise, while headache, naturally frequent in those with a meningeal affection, was pronounced in a few others.

Loss of flesh, strength, and appetite, wherever noted, came on rapidly and was very marked. Likewise night-sweats, though recorded too few times to be of much value, were always profuse.

In one-half of those cases where derangement of the menstrual function could serve as an indication of any general trouble no record is made, but in the other half all the patients had had amenorrhoea for from one to four periods.

In the two cases that had had haemoptysis an old cavity was found in the lungs at autopsy.

The condition of the bowels gave no light in making a diagnosis; cases with tuberculous ulceration of the intestines were apparently affected neither one way nor the other by the lesion.

The tongue was generally coated and dry; in a few cases cracked.

The temperature in a majority of the cases at entrance was 100° F. or over, the pulse 100 or over, and the respiration 28 or over; of the course of each throughout the disease mention will be made later.

In seventeen cases an examination of the urine was made, and albumin, generally a slight trace in amount, was found in eleven. Of the latter, autopsy showed an acute tuberculosis of the kidneys in over seventy per cent., whereas of the six cases in which albumin was not found, only three (fifty per cent.) had a similar lesion. Notwithstanding these numbers are too small to warrant definite conclusions, they at least suggest that there may be some connection between the two conditions.

The eyes were examined in four patients; one, with sarcoma of the hypophysis had atrophy of both

disks; two had a double optic neuritis, and, finally, one had tubercle of the choroid. Considering the importance that some writers attach to this latter condition, it is unfortunate that more cases were not examined with the ophthalmoscope.

Examination of the heart afforded no assistance in diagnosis so far as the recorded results show.

The signs obtained from careful physical examinations of the lungs, though often confusing and misleading, apparently show an undercurrent of certain definite characteristics. The disease is of such a nature, and the lungs are so frequently the seat of some other morbid process that only examinations most carefully made during life, and compared topographically with the lesions found after death, can establish what signs belong properly to an acute miliary infiltration. A few cases carefully studied in this way would help wonderfully to clear up certain obscure points. Unfortunately, from the predominance of some symptom, or set of symptoms, pointing elsewhere than to the chest, the lungs are not infrequently hastily examined merely to exclude a more definite lesion, like lobar pneumonia, and are not again considered during the course of the disease. However, in the present group of cases certain characteristics seemed present so far as could be learned from the recorded examinations, many of which were very carefully and thoroughly made.

In the cases where there was a chronic in addition to the acute tuberculous process—that is, in the acute-chronic cases, percussion showed that dulness was not necessarily confined to the region of chronic infiltration, but might be extended to a considerable distance beyond, and be repeated in some other area where no chronic process existed. In a few simple acute cases where no dulness is recorded, it was probably overlooked; in the remainder it varied from a feeling of lessened elasticity to a moderate degree of dulness in localized regions over a single lobe or even over an entire lung.

In nearly every case where fremitus or vocal resonance was increased, the effect of a chronic induration could not be ruled out.

The respiratory murmur in simple acute cases was, for the most part, indistinct, harsh, with a high-pitched inspiration and a lower-pitched, prolonged expiration. In acute-chronic cases all qualities are recorded, but in the majority it was feeble in intensity, harsh, with high-pitched inspiration, and a prolonged expiration grading from a lower pitch to a bronchial quality.

The râles heard in simple acute cases were almost invariably few in number, fine in quality, dry, and sometimes moist, high-pitched, and less often low-pitched (none of the latter being moist). Often several kinds were to be heard in the same patient. In acute-chronic cases they were coarser in type,

more numerous, and more moist, besides being accompanied by those of a fine dry or a fine moist character. In one or two cases, even with a chronic process, only a few râles of any kind were recorded.

The clinical history of the cases while under treatment can be briefly summarized. They rapidly lost strength and flesh, delirium or coma soon appearing in nearly every case. The pulse steadily increased in frequency and decreased in strength. The respiration, somewhat rapid at entrance, increased in frequency, becoming more and more shallow, and often irregular with increasing cyanosis. A few developed abdominal tympanites; a few, pain in the chest. Even though in several cases a slight amelioration intervened for a few days, the course was steadily and rapidly down-hill to death, and no treatment seemed to be of any avail in checking its progress.

The clinical charts showed nothing very significant, except, perhaps, from a negative point of view. The temperature ranged from 101° to 103° F., on the average, making daily excursions of one or two degrees, while very rarely was it higher in the morning than at evening; it seldom fell below the 100° line, and rarely rose as high as 104° . The pulse rarely fell below 100 , and often rose to 140 beats or more; its line steadily ascended while the daily excursions were not very marked. The line of respiration followed very closely that of the pulse, both frequently being high without any corresponding elevation of temperature. In no case was there cessation of fever before death.

The duration of the fatal illness, reckoning from the initial chill or other marked symptom, averaged thirty days; in uncomplicated acute cases, where the beginning could be more accurately determined, the duration was shorter by about four days. The average length of stay in the hospital, excluding the two cases that died at entrance and one previously under treatment for measles, was fifteen days, so that they were all well developed before any systematic treatment had been undertaken.

The following complications of cases while in the hospital are important: One woman, fifty-eight years old, had sarcoma of the hypophysis with a few cerebral symptoms; one, supposing herself pregnant, had just attempted abortion, and during her stay was attacked with facial erysipelas; one man had general psoriasis, and one had probably an acute tubercular pleuritis.

The post-mortem examination in every case showed an acute miliary tuberculosis of the lungs, and, so far as could be judged, it was the important, or one of the important, pathological conditions. As mentioned before, thirteen showed in addition some degree of chronic tuberculous process going on, often with cavity formation. Where a focus for general

infection did not exist in the lungs themselves, one could always be found in one or more groups of lymphatic glands. In thirteen cases, divided almost equally between the acute and acute-chronic, there was an acute tuberculosis of the meninges, causing so marked symptoms during life that the diagnosis was strongly influenced. Next to the lungs, the following organs were invaded by tubercles: the spleen in 15 cases, the kidneys in 14, the meninges in 13, various groups of lymphatic glands in 11, the intestines (with ulceration) in 10, the liver in 9, the pleura in 7, the pericardium and peritoneum each in 3, the bladder, diaphragm, and a supra-renal capsule, each in 1.

In conclusion, these cases would seem to indicate that an acute pulmonary tuberculosis should be suspected when the following indices are present (the existence of other pathological conditions in the lungs giving rise to characteristic signs and symptoms that ought not entirely mask those under consideration): Sudden severe illness, ushered in with a chill, in a person previously healthy or with a history of chronic phthisis; slight cough and expectoration, no haemoptysis, marked loss of flesh and strength; loss of elasticity, or a slight dulness over part or the whole of a lung or surrounding a limited area of marked dulness; indistinct, harsh respiration, with high-pitched inspiration and prolonged low-pitched expiration; a few scattered fine dry or fine moist râles, generally high-pitched; a rapid, weak pulse, with quickened, shallow respiration, and cyanosis out of proportion to the physical signs; a temperature steadily feverish, but without marked variations; local evidences of miliary infiltration in other organs.

MEDICAL PROGRESS.

The Channel of Tuberculous Infection.—Another piece of work emanating from Dr. Koch's Hygienic Institute, was an address by Dr. Cornet on the channel of tuberculous infection, which is referred to in the Berlin letter to the *London Medical Press* of June 12th.

The knowledge that infection in cases of pulmonary phthisis took place generally through particles of dried sputum reaching the lungs was important from a prophylactic point of view, as the speaker pointed out, and if we could determine the point of entry of the virus in glandular tubercle also, our aim would be more intelligent and precise. The speaker's attention was first directed to the cervical submaxillary and occipital regions. He showed some guinea-pigs into whose conjunctival sacs some sputum containing tubercle bacilli had been placed. No injury of the sac took place. Notwithstanding this, the bacilli grew, penetrated the tissues, and set up swelling and hyperplasia of the conjunctiva. In all the animals caseation and softening subsequently took place in the neighboring glands. The side on which the inoculation took place showed the most extensive changes. In two other animals the nasal

mucous membrane was painted by means of a pigeon's feather, with bacillary sputum in one case, and a pure cultivation of tubercle bacilli in the other. The corresponding glands became tuberculous in both cases. In other cases the cavity of the mouth was inoculated with sputum or pure cultivation material, and all the corresponding glands became tuberculous. In another guinea-pig infective material was introduced into the ear, and the auricular glands became subsequently caseous. In still another animal the skin over the nose was shaved clean and sputum rubbed in, when later on a serpiginous ulceration covered with thick scab, reminding one of lupus, was observed; the cervical glands became much enlarged. Another animal was scratched on both cheeks with a finger-nail dipped into tuberculous sputum, and the ulceration, covered with scab, that followed, spread and became confluent. Another animal was rubbed, but without abrading the surface, with a wash leather that had been dipped into bacillary sputum; after some weeks it was killed, when the corresponding lymph-glands were found enlarged. Other animals again were infected from the vagina, penis, toes, etc. He concluded that tubercle bacilli could penetrate into the system without causing distinguishable injury at the point of entry. The nearest lying glands became tuberculous and illness developed resembling scrofula as it was often seen, and without doubt scrofula depended on a tuberculous infection from without. This was the less remarkable when we remembered how incautiously we treated phthisical sputum, and how frequently children made a way for the entrance of disease by putting every possible object within their reach, covered with tuberculous dust it might be, into their mouths, up their noses, or into their ears.

Capillary Bronchitis in Children.—The necessity for active treatment in cases of capillary bronchitis occurring in young children or infants, is readily recognized. DR. JULES SIMON, in an article on this subject (*L'Abeille Medical*, June 3, 1889), deals at length with the most efficient methods used in treating this disease. The therapeutic measures which he has found most useful are, briefly outlined, as follows: The child should be at once put to bed and well wrapped up; large sinapisms should be placed on the chest, and a teaspoonful (or less, according to age) of the following mixture should be given every hour:

R.—Gum mixture	f 3jiss.
Alcoholic extract of aconite (Fr. P.)	gtt. xv.
Acetate of ammonium	gr. xv.
Syrup of codeine ,	3jss to 3jv.—M.

If necessary, the child should be put in a sinapic bath for about five minutes, and afterward well dried and wrapped in hot blankets. The bath may be repeated at intervals without danger. Stimulants should be given in the form of champagne, egg-nogg, or toddies. If the nervous system has suffered greatly, the following injection may be resorted to:

R.—Hydrate of chloral	grs. viij to xv.
Water	f 3ij.
Tincture of musk	gtt. xx.
Tincture of valerian	gtt. xv.—M.

Quinine will be found most valuable during the entire course of the disease. It is usually administered in doses of from one to two and a half grains, and is best given in the form of a potion in glycerine, with the addition of a little tartrate syrup.

Massage in Chronic Typhlitis and Perityphlitis.—DR. GEORGE HÜNEFAUTH, in an exhaustive article on the subject of massage in chronic typhlitis and perityphlitis, cites fifty-three cases in which the treatment was followed by complete cure. Hot applications to the abdomen were also found valuable, as well as a mild course of water treatment, consisting of rubbing down with cold water, douches, and hip-baths. These have always exerted a beneficial action upon the appetite and sleep. The treatment, which should take place twice daily, and should last for about fifteen minutes, should be continued for three to four months. In mild cases, six or eight weeks will often effect a cure.—*Münch. med. Woch.*, May 28, 1889.

An Antiseptic Solution.—Under the title of "An Ideal Antiseptic," DR. ROTTER, in the June number of the *Gazette de Gyné.*, gives the following formula:

Corrosive sublimate	5 parts.
Chloride of sodium	25 "
Phenic acid	200 "
Chloride of zinc }	aa 500 "
Sulphocarbonate of zinc }	300 "
Boric acid	60 "
Salicylic acid	Thymol }
Citric acid }	aa 10 "
Water	100,000 " —M.

If a weak solution be required, the sublimate and the phenic acid may be omitted. The above solution will not injure instruments.

The Treatment of Dysentery with Creolin.—After having carefully observed the effects of creolin in sixteen cases of dysentery, DR. OSSOVSKI, in the *Revue gén. de clin. et de Thér.*, June 6, 1889, unhesitatingly recommends it in this disease. The treatment followed by him was merely to give the patient two to four large injections daily of a solution of creolin (1 to 100). Besides its antiseptic properties the drug also acted as a hemostatic, and quickly checked the bleeding of the irritated intestine. When given to patients subject to malaria, the drug in some instances caused a rise of temperature, which, however, was speedily overcome by quinine.

Exalgin in Dysmenorrhœa.—Exalgin is fast being introduced into the therapeutics of various ailments. Its most recent successful use is, perhaps, in neuralgic dysmenorrhœa, in which painful affection its anodyne properties give most satisfactory results. The following formulæ for its use are quoted from the *Revue de Thér. méd.-Chir.*, June 1, 1889:

R.—Curaçao	f 3jss.
Exalgin	grs. xl.—M.

A teaspoonful of the above contains about four grains of exalgin. Curaçao is the best medium for its ad-

ministration, as it almost completely disguises the unpleasant taste of the drug. Another agreeable formula is:

R.—Linden-flower water	100 parts.
Laurel water	10 "
Curaçoa	40 "
Exalgyn	3 " —M.

Sig. A seaspoonful to be taken every half hour until the pain ceases. Doses of a dessertspoonful may be given if the pain is very intense.

Fracture of the Thyroid and Cricoid Cartilages; Recovery.

—An interesting and rare case, reported in the *Lancet* of June 8, 1889, was recently exhibited by DR. SOKOLOVSKI at the Warsaw Medical Society, of a woman in whom the anterior portion of the thyroid and both halves of the cricoid had been fractured through an accident with the strap of a mill. The immediate symptoms were severe pain in the throat, cough, and the expectoration of a considerable quantity of blood, also marked dyspncea. Tracheotomy (inferior) was performed the second day. During the fourth week portions of the necrosed cartilage came away. After two months both halves of the thyroid were removed with forceps, and it was found that no trace of the cricoid remained, the posterior wall of the glottis being formed by the anterior mucous coat of the œsophagus. The patient made a good recovery, and was soon able to swallow food without difficulty. It is noteworthy that the condition of the larynx was accurately ascertained on the second day after the accident by means of the laryngoscope, and also that cases of fracture of the cricoid are almost invariably fatal.

Cocaine Poisoning.—From the large number of cases of cocaine poisoning which have been reported, it is evident that in different individuals the susceptibility of the drug is very different; indeed, this is the case in the majority of instances. This fact calls for the greatest caution in the use of the drug.

Probably the toxic symptoms which have been observed are due to an irritation of the sympathetic nerve, as dizziness, coldness of the extremities, perspiration, enlargement of the pupils, and a quickening as well as weakening of the heart's action are always observed.

The treatment of severe cases of poisoning, when accompanied with marked symptoms of collapse, must be the active use of stimulants; in cases of severe muscular movements unaccompanied by loss of consciousness, narcotics will be found valuable. Some authorities claim to have observed beneficial effects from inhalation of nitrite of amyl. From numerous experiments upon animals RICHEZ and LANGLOIS have discovered that the toxic action of cocaine is greater when the animal is subjected to a high temperature, and steadily increases with the rise of temperature. When a dog, into which a minimal quantity of cocaine had been injected, was placed in a bath of a temperature of 107° F., it was immediately seized with convulsions. The same animal was able to endure, without toxic symptoms, an injection fifteen times as large as the preceding one, when placed in a bath of a temperature of 87° F. Cold baths or applications would, therefore, constitute a most rational therapeutic agent in cases of cocaine poisoning in man.

We quote two recent cases of cocaine poisoning which

are of special interest. The first is reported by DR. HÄNEL in the *Berliner klinische Wochenschr.* A dentist injected 1 $\frac{7}{10}$ grains of cocaine into the gum of a strong, although somewhat chlorotic, nineteen year old girl, prior to the extraction of a tooth. The above quantity he divided into two injections. Immediately after the second injection the patient became pale and fell into strong convulsions. Nitrite of amyl had no effect. When Hänel saw the patient she was entirely insensible, slightly cyanosed, and in severe convulsions which lasted for five hours. The pupils were greatly enlarged and showed no reaction; pulse at first impossible to count, later 176; respiration 44. The temperature in the axilla at the end of this stage was 101° F. After the convulsions had ceased the patient lay unconscious for two hours and upon awaking evinced a strong photophobia. The skin was slightly anaesthetized, the mouth, throat, and nasal cavity totally so. Other symptoms were thirst, retching, retention of urine, lasting twenty-four hours; sleeplessness for thirty hours, and total loss of appetite. All the symptoms above named, with the exception of the last, disappeared within two days. Hänel is of the opinion that the maximum dose of cocaine should not exceed half a grain, and that in patients with cardiac weaknesses even this dose is inadvisable.

The second case, which is reported by DR. MOIZARD in the *Centralbl. für Chirurg.*, June 1, differs from others in that the drug was taken by the mouth, whilst in the majority of poisoning cases recorded the drug has been administered hypodermically into the mucous membrane. Nearly four grains of cocaine in solution were given by mistake to a child aged four. The symptoms manifested were muscular twitchings, convulsions, nystagmus, extreme nervousness without loss of consciousness. These lasted for several hours. The next day there were still slight muscular twitchings which, however, ceased in thirty-one hours. The therapeutics employed were primarily emetics and subsequently cathartics.

Morphine-Vaseline as a Local Application in Cancer.—

According to DR. B. W. RICHARDSON, morphine combined with vaseline forms one of the best possible sedative applications in cases of external malignant disease in which there is ulcerative breach of surface with continuous pain. The mode of prescribing the preparation runs as follows:

R.—Vaseline, pure	3j.
Chloroform	3ij.
Morphine	gr. iv.

Mix thoroughly and make into an ointment.

By using the chloroform a larger quantity of morphine can be introduced than if the alkaloid were used alone, the distribution through the mass being more complete. The chloroform, in the proportions named, causes, as a rule, no irritation, but acts rather as a sedative. Chloroform also is a powerful antiseptic, and as such is a good remedy in the class of cases under consideration.

Morphine-vaseline is most conveniently applied thinly spread over a piece of fine lint or soft linen. It is easily removable without injury to the surface upon which it is applied, and it may, therefore, be used even on surfaces from which the danger of hemorrhage is foreseen. The dressing may be renewed twice in the course of twenty-four hours.—*The Asclepiad*, 2d Quarter, 1889.

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SATURDAY, JULY 20, 1889.

A TYPHOID EPIDEMIC FROM POLLUTED WATER.

THE annual report of the Superintendent of Health, of Providence, R. I., for 1888, contains an account of an epidemic of typhoid fever extending through the months of November and December of that year, which embodies several features of more than ordinary interest. In searching for the cause of the outbreak suspicion pointed to the water-supply as being most likely at fault. Accordingly, an inspection was made of the valley of the Pawtuxet, the river which furnishes the water-supply of Providence. The result was the discovery of contamination of the river water by typhoid excrement discharged into it at the village of Natick, about three and one-half miles above the pumping-station. Biological investigations of the water-supply of the city were immediately instituted with the object of discovering the particular organism of typhoid fever, but with only negative results. The failure is not surprising, as the detection of this particular species in a body of water whose daily flow is many millions of gallons is a task of extreme difficulty.

During the epidemic a large number of patients were found who had used water which had been passed through ordinary domestic filters, and it was determined to examine some of these filters in order to learn whether or not they contained the specific organism. The filters were obtained from houses in which there were cases of true typhoid fever, and care was taken to select only those in which there

was no chance of contamination except from the water which passed through them. The bacteriological examinations were made by Dr. Swarts, the medical inspector, Dr. Prudden, of New York, and Dr. Ernst, of Harvard, all skilled bacteriologists. Besides the typhoid bacilli, several organisms characteristic of fecal matter were found in the filters, indicating the source of specific contamination. The results of the investigation seem to warrant the conclusion that the epidemic was due to the pollution of the Pawtuxet River by the excretion from typhoid fever patients. It is to be regretted that a comparison was not made between the number of cases of fever among persons who had used filtered water and those who had used water direct from the faucet.

The report incidently illustrates the inefficiency of domestic filtration. There can be no doubt that filters of the ordinary kind, composed of gravel, sand, and charcoal, and similar media, favor the development of bacteria. The results of the experiments of Dr. Currier, recently published in THE NEWS, show conclusively that filters, after continued use, yield water teeming with bacteria, although the unfiltered water may contain only a small number of these minute forms of life. Even the porcelain and stone filters, which are by far the most efficient, need to be sterilized at brief intervals in order to maintain satisfactory action. When water contains only harmless bacteria this special defect in filters is of little consequence; but when, perchance, the specific organism is present, the filter becomes a culture-bed for the multiplication of germ-life which is capable of infecting the water passing through it for an indefinite length of time.

Domestic filtration, unless conducted under scientific oversight, which is impracticable, apparently tends to increase the danger from the use of water containing infectious matter, and is therefore unreliable. The perfection of house-filters according to the germ-test is a most difficult problem. Even when the question is solved, the fact remains that these aids to purification are used by only a small proportion of the population. When, therefore, water is sufficiently impure to require filtration, it is most advantageous to have the process carefully conducted on a large scale at the public works.

It is a false civic economy and reprehensible administrative policy that dallies with a doubtful or positively bad water supply, and burdens the individual with expedients for protecting himself from

the possibly injurious effects from its use. The purest and best possible water should be obtained at whatever expense, and the supply carefully protected from contamination, and, if necessary, the most reliable means of artificial purification employed. When this is accomplished domestic filtration will be unnecessary.

The connection between typhoid fever and drinking water contaminated by excremental matter of specific quality as a cause, has been well established. It has also been ascertained that filters, such as are in common use, do not remove the infectious matter from water thus contaminated. When, therefore, there is real danger of infection, filtration may be employed to remove sediment or cloudiness, but the only safety lies in finally boiling the water.

CAFFEINE IN MIGRAINE.

DR. E. J. OVEREND, of Oakland, writes in the *Pacific Medical Journal* regarding his personal experience with caffeine in sick-headache. Having himself been a victim for many years, he has had an ample opportunity to test the comparative values of many drugs, from the study of which he rises with the conviction that caffeine comes as near being a specific in migraine as does quinine in intermittent fever. He is even inclined to rate its claims to specificity beyond those of the latter, but like that drug its prophylactic power outranks its curative value. His practice is to anticipate the attack by doses of two to five grains hourly, dispensed in capsules; this seldom fails to abort the attack if taken sufficiently early, or if not so taken, a marked amelioration of the symptoms results. He counsels his patients not to procrastinate, as they are prone to do, but to begin promptly the dosage as soon as the well-recognized prodromes appear. When capsules are objectionable to the patient and a solution is preferred, the salicylate of sodium should be combined with the citrate of caffeine, his belief being that the former salt not only renders the latter more stable, but also acts as a synergist. If recently reported experiments are correct, caffeine has another noteworthy advantage in that it does not enslave as do some of the narcotic remedies that are used in this affection. He has not found it necessary to increase the dose progressively, as is commonly the case with the habit-forming drugs.

Of the various proprietary preparations containing caffeine he has no commendatory evidence to give;

they contain too little caffeine and too many unnecessary adjuncts, and of the effervescent compounds he remarks that they seem to contain more "fiz" than caffeine, and they give him the impression that cheapness plays a part in their construction. Dr. Overend's paper is written in a scholarly and sympathetic vein and we recommend it to the many medical men who are victims to migraine as a useful bit of post-graduate instruction.

As a result of the introduction of a supply of pure water from the Höllengebirge, in 1874, the death-rate of Vienna has fallen from 35.2 to 25.3 per 1000. The deaths from typhoid fever alone up to 1874 amounted to 700 each year. Since that time the number of deaths from this disease has fallen to 169 per annum. But Vienna has outgrown the capacity of the Höllengebirge to meet its wants, and a portion of the supply has been derived from the Potschach and also from the Schwarza Canal, the latter source being of doubtful quality. The recurrence of typhoid fever the past winter, coincident with the use of this suspicious water, has excited public comment, and plans are already being considered for supplementing the supply from greater and more distant altitudes. The beneficial effects of an improved water-supply have been so plainly demonstrated by practical experience that the Viennese municipality has been warned that no relaxation of its efforts on behalf of the public health will be tolerated.

DR. J. SOLIS COHEN, of Philadelphia, was elected, at its last meeting, an Honorary Fellow of the British Laryngological and Rhinological Association.

THE Tenth International Medical Congress will be held at Berlin on August 4 to 9, 1890. A general meeting of representatives of all the medical faculties and societies in Germany has been called by Professors Virchow, von Bergmann, and Waldeyer for September 17, to discuss the arrangements to be made for the Congress. Among those expected to be present at this conference, it is stated, are all the men of light and leading in the medical profession in Germany.

THE Seventh Special Meeting of the Fifth District Branch of the New York State Medical Association, will be held in Port Jervis (Orange Co.) N. Y., on Tuesday, August 27, 1889, under the presi-

dency of Dr. W. T. Lusk, of New York. For those who are willing to spare the time after the meeting, a beautiful and interesting carriage drive of seven miles along the Delaware River to Milford, Pa. is promised. The Committee of Arrangements, of which Dr. J. H. Hart, of Orange Co., is Chairman, is making every preparation to insure an interesting meeting, both scientifically and socially.

THE Twentieth Annual Session of the Medical Society of Virginia will convene at Roanoke, on Tuesday, September 3d, at 8 P. M., under the presidency of Dr. E. W. Row, of Orange.

AT the annual commencement of the medical department of the University of Vermont, held at Burlington last Tuesday, the degree of M.D. was conferred on sixty graduates.

AT the recent commencement of the College of Physicians and Surgeons of New York, it was announced that the Cartwright Prize had been awarded to an essay written conjointly by Dr. Hobart A. Hare and Dr. Edward Martin, of Philadelphia. The successful competitors have voluntarily surrendered the prize because their essay had just been awarded a prize elsewhere. It appears that the essay had been put in competition for both prizes, with the expectation that the decision of one prize would be made early enough to permit them to withdraw from the second competition in case they were successful in the first. But owing to delay in the decision of the prize which should have been announced first, and to the absence of the authors from home when the announcement was finally made, there was no opportunity for the intended withdrawal before the award of the Cartwright prize was published.

The award of the Cartwright prize has consequently been reconsidered, and the prize has been awarded to Dr. Ira Van Gieson, Assistant Instructor in Normal Histology in the College of Physicians and Surgeons of New York, for his essay entitled, "Studies in Neural Pathology, embracing, (1) A Report of a Case of Syringo-myelia; and (2) A Contribution to the Pathology of the Laryngeal and other Crises in Tabes Dorsalis."

DR. ELWOOD WILSON, a prominent and highly esteemed practitioner of Philadelphia, died at his suburban residence in Delaware County last Sunday,

aged sixty-seven years. Dr. Wilson graduated in medicine at the Jefferson Medical College in 1845. Early in his professional career he devoted himself to obstetrics, and he attained a large practice and high reputation in this department. He was formerly lecturer on obstetrics and diseases of women at the Philadelphia Lying-in Charity, and later one of the consulting physicians and president of the institution. He was a member of the American Gynecological Society, of the College of Physicians of Philadelphia, of the Philadelphia Obstetrical Society, and a Trustee of the Jefferson Medical College.

REVIEWS.

CYCLOPÆDIA OF THE DISEASES OF CHILDREN, MEDICAL AND SURGICAL. Edited by JOHN M. KEATING, M.D. Vol. I. 8vo., pp. 992. Philadelphia: J. B. Lippincott Company, 1889.

WE seem to be living in the days of encyclopædias; two on general practice, one each on obstetrics and gynecology, and, finally, the one under consideration. The large *Handbook on Diseases of Children*, edited by Gerhardt, first began to make its appearance twelve years ago, and at that time its chances of success were considered rather problematic. No one, in those days, dreamed of the possibility that in a comparatively short space of time a demand would come for an encyclopædia on the subject of diseases of children written by English-speaking authors. Yet such has been the case, and we see before us the first volume of nearly one thousand pages, to be followed by three more equal to the first in size.

It will be a matter of no little surprise to those who have not followed the development of the literature of pediatrics, when they see how much can be written upon diseases of children. Those, on the other hand, who are acquainted with the enormous strides that have been made within the last fifteen years, will, perhaps, be astonished that a few of the articles in this volume have not received more thorough treatment. However this may be, if we compare the present volume with that of Dewees (1833), or Eberle (1834), American books published in this country, or even with the classical book of West (first published in 1848), it soon becomes apparent how much pediatrics has developed among English-speaking people. We are not too bold when we assert that the most incomplete article of this volume is encyclopædic in comparison with the article upon the same subject in any one of the above-named books.

The effect that the publication of such a work as this encyclopædia must have upon the further development of pediatrics is incalculable. When once the attention of the medical public is called to a subject, its interest is quickly enlisted, and contributions soon flow in to help increase the general fund of knowledge. It has seemed to the writer that our physicians have been drifting in directions neither as useful nor important as pediatrics. Ovariotomists, abdominal surgeons, rhinologists, laryngologists, etc., are to be found in almost every small city east of the Mississippi River. Notwithstanding the assertion made by Jacobi in the splendidly written introduction to the

work, we believe the tendency now-a-days is toward specialism, and when the profession awakens to the fact that the subject of pediatrics is a specialty, broad, liberal, comprehensive, and one which cannot be acquired except as the result of evolution from general practice, it will not then be slow in availing itself of the opportunities afforded by such a work as the one under consideration. Again, not any one of the smaller works on diseases of children is satisfactory or adequate to the wants of the thinking physician. One difficult case elucidated by an author makes a whole volume valuable; the absence of discussion, of exceptions, or modifications, makes it valueless. In the present state of science, small books upon a great, broad, and comprehensive subject must be relegated to the class of text-books, the importance of which must not be underestimated. Every practitioner ought to develop beyond the state of relying upon text-books; for such, this book is invaluable.

It seems necessary to state that some weak articles will be found in a work written by so many authors. No book of cyclopaedic character has ever been published in which the foregoing is not fully illustrated. If the volumes which are to follow will be as good as the one just published—and the names of the authors who will write for the forthcoming volumes seem to be ample guarantee for this—this *Cyclopædia of Diseases of Children* will be able to hold its own against any that has appeared.

The editor and publishers have every reason to congratulate themselves upon their success, and the profession ought to be grateful to them for a marked advance in science, as well as decided contributions to our knowledge.

SOCIETY PROCEEDINGS.

AMERICAN MEDICAL ASSOCIATION.

Fortieth Annual Meeting, held at Newport, R. I., June 25, 26, 27, and 28, 1889.

(Specially reported for THE MEDICAL NEWS.)

SECTION OF PRACTICE OF MEDICINE.

DR. FRANCIS DELAFIELD, of New York, read a paper on

CHRONIC ENDOCARDITIS,

in which he discussed why in some cases there are disturbances of the circulation, and why in other cases there are not. These disturbances are due to the endocarditis, the dilatation and hypertrophy of the ventricles, the inflammation or degeneration of the wall of the heart, inflammation of the coronary arteries, abnormal heart action, the associated pulmonary emphysema, chronic endocarditis, and chronic Bright's disease. These act singly or together.

The most important of these are the endocarditis, the abnormal heart action, and the secondary and complicating changes in the kidneys. These conditions he discussed at length, dwelling mainly upon the etiology and symptomatology of the affections.

DR. PEPPER was particularly glad to note the importance attached to the arterial changes in their bearing upon heart lesions. Doubtless when we have more exact knowledge of the changes which occur in the various

ganglia of the heart, we shall find that they too play an important rôle. Just as recent observers have described changes in the ganglia of the kidneys associated with changes in the vessels and stroma of those organs, so it will undoubtedly be found that there are important changes in the cardiac ganglia which are associated with lesions of the valves or walls, and which exert an important influence on the production of symptoms. In regard to Dr. Delafield's distinction between a chronic inflammation and a deformity, it must be remembered that when only the latter remains, it is of an organ with the closest relations with life, and with the most important and ceaseless mechanical function to perform. The causes of endocarditis are numerous, and often obscure. It may be some antecedent infectious disease has left germs which are exciting morbid action there, and it is becoming clear that some trifling endocardial lesions may be roused into dangerous activity by the invasion of various germs. The relations of the endocarditis with nutritive disturbances, and the danger of recurring congestions and irritations, emphasize the importance of rigid regimen and treatment as long as evidences of active endocardial process are present.

When, however, we have only the results, in the shape of valvular disease, we have thoughts of fundamental importance quite aside from the question of medication. One of the most important concerns the mass of blood and its relations with the needs of the body and with the capacity of the cardiac apertures, and the capacity of the cardiac walls and cavities. The difficulty of the mechanical work which is performed by the crippled organ is determined by the friction to be overcome and the mass to be moved. The state of the arteries has a vital bearing upon this, as well as the mass of blood. Serious symptoms often persist until the latter is reduced by restricted diet, saline laxatives, or continuous venesection. He cited a case in which alarming symptoms of cardiac failure were relieved by epistaxis. If the body-weight be excessive, especially when owing to excessive adipose formation, great and unnecessary strain is thrown upon the heart. Hence it is often necessary to reduce the weight while improving the tone of the system. This is done by gradual exercise, passive or active, and, if necessary, by suitable remedies. Most important and essential is the improvement in the system's tone. Nothing is more injurious than the relaxed and oversensitive state of the system so commonly met with and often associated with the rheumatic diathesis.

DR. OSLER remarked that in the majority of cases of chronic endocarditis no symptoms are manifested. It is not the disease, but the gradual failure in compensation that causes the symptoms.

DR. JAMES TYSON, of Philadelphia, read a paper entitled

THE INDUCTION OF PREMATURE LABOR IN BRIGHT'S DISEASE OF PREGNANCY.

The procedure was recommended: 1. In cases in which in a previous pregnancy there has been puerperal nephritis with grave complications. 2. With a view of saving the life of the patient in all puerparæ in whom there is Bright's disease previous to pregnancy. He had had so many cases of this kind in which death followed upon the first confinement, that he had grown to regard the girl thus affected as walking to her death as she walks

to the altar, and, if the opportunity present, he discourages marriage in the strongest terms. Should it happen, however, that a girl thus afflicted does marry, she should never be allowed to go to term, but premature labor should be induced as soon as the fetus is viable. 3. Those cases of puerperal nephritis not included in the first and second categories, viz., those in which we have not the knowledge gained by experience with a previous occurrence of the disease in the same patient, and those which are not primiparæ having Bright's disease previous to marriage. They include acquired puerperal nephritis in multiparæ where a previous labor has been accomplished without serious results. In this category no definite course can be laid down. In general, it may be said, that the supervention of uræmic symptoms demands immediate interference, but in consequence of the variety in these, and their occasional simulation by symptoms due to other causes, care must be observed lest an error in diagnosis be made.

As a rule, too, the same symptoms are more serious in robust, plethoric women than in the delicate and less hardy. Bright's disease acquired in the first pregnancy is a very much more serious complication than in a later one, and labor is rarely terminated without grave symptoms.

DR. VICTOR VAUGHAN, of Ann Arbor, stated that certain women always have uræmic symptoms. We do not really know what they are due to. He agreed with Dr. Tyson that premature labor should be induced early in these cases, because, if manifested once or twice, the affection will return, and sometimes very quickly. He cited the case of a woman who had been pregnant several times, and who suffered with convulsions during each pregnancy. During the last pregnancy, twenty-four hours after an examination had shown normal urine, albumin was found, and she passed into uræmic coma. According to his experience, it was wisest not to allow these patients to go to full term, except in primiparæ, in whom it was not justifiable to be too hasty. We know that the poisonous elements are formed from the proteids in the food and tissues. He thought that we could do much with diet in which the proteid food had been discarded, and with free elimination.

DR. I. E. ATKINSON, of Baltimore, thought that the question to discuss was, "Under what conditions are we justified in inducing premature labor?" It is just in primiparæ that we get the terrible results from puerperal convulsions. According to his experience the contracted kidney is the most prolific source of these troubles. Still many patients pass through this dangerous period with happy results. He, however, did not believe in one moment's delay after the mildest symptoms have become manifested. Those suffering with other forms than contracted kidney get along better, as a rule.

THURSDAY, JUNE 27TH.

DR. VICTOR C. VAUGHAN, of Ann Arbor, read a paper on

THE ETIOLOGY OF TYPHOID FEVER.

He stated that the Eberth bacillus is now generally regarded as the true cause of typhoid fever. He showed to what extent the four rules of Koch had been complied with in the study of this germ. After citing the observations of a number of authorities, he stated that the number of cases of genuine typhoid fever in which this germ

has not been found when the examinations have been made by competent men is so small that we are justified in claiming that the first of Koch's rules has been complied with. That the second of Koch's rules has been complied with there is no doubt. Pure cultures of this germ are to be found in every bacteriological laboratory. It grows rapidly in our artificial media and its characteristics of growth are well known. He called attention to the most important of the numerous and interesting attempts which have been made to induce the disease in the lower animals by inoculation with the Eberth germ. Thereby it was shown that all attempts to accomplish this have so far been without success. Experiments show not only that the germ fails to multiply in the lower animals, but that, when introduced by inoculation, it soon dies.

The bacteriologist says here: "The lower animals do not have typhoid fever, and we must not conclude from the failure to induce this disease in lower animals with the Eberth germ that the bacillus is not the true cause of typhoid fever." If we could experiment upon man he would have no doubt that we would be successful. Hence, he wished to discuss this germ from the standpoint of a chemist.

He thought that it was now time for us to add to the rules of Koch the following: "Before any microorganism can be considered the true and sufficient cause of a given disease, it must be shown that the chemical products of that germ are capable of producing the characteristic symptoms and lesions of that disease in an acute form." This demonstration has been given in anthrax and tetanus. Recent extended researches by Brieger on this point failed to discover in cultures of the Eberth germ any real typhoid poison. With this in view we certainly cannot say that the Eberth germ has been demonstrated to be the true and sufficient cause of typhoid fever. He was forced, from the evidence at hand at present, to concur with Brieger, who is inclined to the opinion that Eberth's germ plays a secondary rôle in the causation of this disease.

Since, then, there seems to be very good reason for regarding typhoid fever as due to mixed infection it may not be without interest to inquire briefly into some of the experiments made with impure culture or with germs other than the Eberth. He detailed experiments by Murchison, Klein, and Bohardt, by feeding with typhoid stools, and those made by Motschutkoffski and Walder, by inoculation with blood of typhoid patients, which were unsuccessful. Birch-Hirschfeld's experiments were referred to, as also those of Brautlecht, who employed organisms obtained from drinking-water which had been used by those who subsequently had typhoid fever.

Drs. Vaughan and Novy obtained from drinking-water from Iron Mountain, where there had been a severe epidemic of typhoid fever, a germ which they could not distinguish, by microscopical appearance, reactions with staining reagents and growth in gelatine tubes and on potatoes, from the Eberth bacillus.

March 5, 1888, they inoculated three dogs with this germ taken from a beef-broth culture, twenty days old. The germs were washed with sterilized water, then suspended in the same menstruum and injected into the peritoneal cavity, all precautions, such as shearing off the hair, washing first with a solution of bichloride of mercury and then with alcohol, having been taken, and

neither at the point of inoculation nor anywhere else in the animals was there at any time any evidence of septicaemia. The dogs were placed in a large cage with a fourth one which was employed as a control. For some four or five days after the inoculations, they took the temperature of the animals daily, but there being no variation beyond the normal limits they supposed the experiment to be negative, and neither of them visited the animal room until the second day of April, twenty-eight days after the inoculation, when the janitor told them that one of the dogs had died and the two others had grown very thin and seemed to be sick. A post-mortem examination surprised them by revealing very prominently some of the lesions of typhoid fever. The animal was very much emaciated. Drs. Hendricks and Brewer were asked to make the post-mortem and the following is their report on the same:

"The weight of the body was twenty pounds. Upon the abdominal cavity being opened the mesenteric fat was observed to be pink with hemorrhagic spots. The bloodvessels of the intestines were found to be highly injected with numerous points of hemorrhagic infiltration. On the mesentery near the cæcum were large hemorrhagic spots. The lower inch and one-half of the ileum was distended and covered externally with clotted blood. The mesenteric glands were enlarged to four or five times their normal size and each contained hemorrhagic spots. The glands of the vermiform appendix were much enlarged and were pitted in the centre. Under the mesentery of the cæcum was a plastic exudate, almost transparent. The descending portion of the duodenum showed numerous bright hemorrhagic spots along the line of its junction with the mesentery.

"Along the upper portion of the ileum the intestine presented a greenish macerated appearance and a soft pulpy feel. Air blown into the intestine escaped through the walls at this point. The mucous membrane of the ileum was swollen and Peyer's patches enlarged, but there were no distinct ulcerations. The liver was indurated and of a deep cherry color, weight twenty-three ounces. The kidneys were enlarged to twice the normal size and were dark in color. The spleen was enlarged and of a dark purple color. The stomach was contracted and its mucous membrane showed a few hemorrhagic spots. The lungs were normal and the heart in diastole and free from clots. The thymus and lymphatic glands were enlarged."

He regretted exceedingly that no attempt was made to obtain cultures from the mesenteric glands or spleen of this animal. The next day they took the temperature of the other dogs with the following results:

	No. 2.	No. 3.	Control.
April 3, 3.00 P. M.	105.0°	103.8°	100.8°
" 3, 5.30 P. M.	105.6	104.4	100.4
" 4, 9.00 A. M.	102.8	104.6	100.8
" 4, 3.30 P. M.	103.0	105.0	101.2
" 5, 10.00 A. M.	105.0	103.8	101.4
" 5, 2.30 P. M.	104.0	103.8	101.7
" 6, 9.30 A. M.	105.6	104.8	101.4
" 6, 3.00 P. M.	106.0	106.2	101.8
" 7, 2.30 P. M.	106.8	105.0	101.0
" 7, 7.30 P. M.	106.8	105.2	101.0
" 8, 11.30 A. M.	104.0	101.4	
" 8, 6.00 P. M.	104.2	101.0	
" 9, 10.00 A. M.	101.0	101.0	
" 9, 6.00 P. M.	101.0	101.5	

During the night of April 7th No. 2 died. The post-mortem revealed practically the same condition as found in No. 1, save that there was no perforation of the intestines. As is seen from above figures, No. 3 had no fever on April 9th, and remained in apparent health as long as he was under observation, which was until June 18th.

Twelve other dogs were inoculated April 18th with a subsequent culture of this organism. In four out of twelve the temperature at the end of the first week registered between 104° and 105°, by the close of the second week it had fallen to 103°, and during the next week became normal and remained so. In each of three others the highest temperature was 103.5°. The others were not apparently affected. Not only did the germ seem to lose its virulence, but it soon failed to grow in the culture tubes and died out altogether.

Notwithstanding the marked resemblance of these cultures to those of the Eberth germ, Dr. Vaughan concluded from the effects obtained that they were either a wholly different organism or an impure culture. He did not know that these experiments can be considered of any special importance, but taken together with those of Brautlecht, he thought that they give encouragement for further experiments with microorganisms which may be obtained from the drinking-water used by those who have typhoid fever.

During the past six months he had spent four or five hours a day upon the study of the etiology of typhoid fever, approaching the work from a wholly different standpoint from that indicated in the preceding pages. He began last December a chemical study of typhoid stools, with especial reference to the presence of ptomaines in the same. He soon met with great difficulty. In the first place, it was not always easy to have at hand material in sufficient quantity, and although friends practising where epidemics of the disease existed, kindly took the trouble to endeavor to supply him, this difficulty alone was sufficient to cause him to alter his plans. Moreover, the coloring matter present was taken up by his solvents, and it proved no light task to exclude them. He finally adopted the following method: The stools were received directly from the patient in a sterilized vessel. With a sterilized platinum needle flasks of meat-broth, previously sterilized, were inoculated with these stools. These flasks were then kept at a constant temperature of from 38° to 40° C., for varying periods of time, after which he attempted to isolate any ptomaines that might be present. Thus it will be seen that he worked with a mixed culture containing all germs present in the feces, the object being to ascertain whether or not the basic substance or substances formed in such cultures would differ from the ptomaines of Eberth's bacillus.

The method of isolating the ptomaine was as follows: After the cultures on meat broth had been kept in the incubator at the temperature of from 38° to 40° C. for from ten to twenty days, they were filtered and rendered feebly acid with hydrochloric acid. At this time the cultures were invariably ammoniacal. The acidified filtrate was then evaporated to dryness, or as nearly to dryness as could be done, on the water-bath. The residue was extracted with absolute alcohol, the extract precipitated with an alcoholic solution of mercuric chloride, saturated at the temperature of the water-bath, the precipitate was collected, washed with alcohol, sus-

pended in distilled water, and decomposed with hydrogen sulphide. The mercuric sulphide was removed by filtration, the filtrate evaporated to dryness on the water-bath, and this residue extracted with absolute alcohol, the extract precipitated with a solution of platinum chloride in absolute alcohol, the precipitate collected, washed with absolute alcohol and dissolved in distilled water. The aqueous solution was concentrated on the water-bath until the platinum compounds began to crystallize out. This aqueous solution contained two or more platinum compounds; but so far he had given his attention to only one of them. This forms in rhombic prisms which are purified by repeated recrystallization. For purposes of physiological experimentation, this platinum salt was decomposed with hydrogen sulphide, and the filtrate concentrated nearly to dryness on the water-bath, when the crystals form. This is the hydrochloride of the ptomaine.

The following experiments show the action of this ptomaine:

February 6, 1889. An aqueous solution, neutral in reaction, of this ptomaine was injected under the skin over the abdomen at 2.50 P. M. The temperature in the rectum before the injection was 100.5°. At 3.35 the temperature was 102.6°; at 4.10, 103.2°. About this time severe purging set in, and continued with intermissions and prolonged straining for an hour. At 4.35 the temperature was 103.4°; at 5, 103.9°; at 5.30, 104°; at 6, 103.9°. The temperature was not taken again until 9 A. M. Feb. 7, when it was found to be 102°; at 12, 101°; at 6 P. M., 100.5°. Between 2.50 P. M. and 5.30 P. M., or within two hours and forty minutes, the temperature of this animal went up 3.5°. The straining and purging were also marked.

May 18, 1889, he gave by the mouth an aqueous solution of the crystals to a dog, which weighed fifteen pounds. The rectal temperature before the administration of the poison was 101°; the time of administration, 3 P. M. At 3.15 retching and vomiting set in, and continued at intervals for more than two hours. At 3.30 the temperature was 103°, an elevation of 2° within a half hour. At 3.55 the animal began to purge, the first discharges contained much fecal matter, but the subsequent ones were watery, and some of them contained mucus plainly stained with blood. At 4 the temperature was 103.5°, and remained the same at 4.30. The animal was not seen again until 10 A. M. the next day, when its temperature was 100.5° and recovery seemed complete.

He referred to other experiments with this ptomaine, but as they were repetitions of the above in general, he did not detail them. He did not place any great stress upon the elevation of temperature when that was the only symptom, but when taken with the gastro-intestinal disturbances he thought he had reasons for hoping that the discovery of this ptomaine may prove of value in elucidating the etiology of typhoid fever. Of course, further experimentation is necessary. It remains to be seen whether or not typhoid stools invariably contain germs capable of producing this chemical product, also whether or not the same germs are contained in normal stools, or in those of any other disease than typhoid fever. Moreover, he hopes by means of making plate cultures to determine whether this ptomaine is the result of the activity of a single germ or of two or more microorganisms. The stools used in these experiments were

from undoubted cases of typhoid fever and from three widely separated outbreaks of the disease.

Some of the conditions influencing the formation of this poison may be of interest. It was found most abundantly when the cultures were kept at a temperature of 40° C. for a period of ten days. After this time the amount of the yield grows less, though he has found traces after twenty days. He obtained larger quantities from cultures made on pork broth than upon beef broth, though the poison was never absent in the latter. From six quarts of pork broth he obtained as the greatest yield nearly two grammes of the platinum compound. Though he had made several partial ultimate analyses of the platino-chloride he was not quite ready to give a formula for this base, nor did he care to propose a name for it at present.

The platino-chloride crystallizes in fine rhombic prisms and the hydrochloride in red needles, which he showed. The red color seems to be inherent to the substance and not due to impurities. The hydrochloride obtained from the decomposition of the mercury compound has the same color as that from the platinum compound. The mercury and platinum compounds are insoluble in absolute alcohol, soluble in water. The hydrochloride is soluble in both water and alcohol.

DR. W. H. WELCH, of Baltimore, said that he must protest against accepting one condition which Dr. Vaughan formulated, viz.: "That before we admit that a certain microorganism is the cause of a disease, we must isolate from cultures of this organism chemical products which are capable by inoculation or feeding of producing the symptoms of the disease." It is certainly an important addition to our knowledge of a disease to become acquainted with such chemical products, but this is not essential to a belief in the causative agency of a specific organism. If Dr. Vaughan's condition be accepted as an essential link in the chain in proof, then we have no sufficient evidence that many recognized infectious organisms, such as the spirillum of relapsing fever, the bacillus of leprosy or even the tubercle bacillus are the causes of their respective diseases. From our present knowledge we are justified in believing that a microorganism which is invariably associated with a disease, which is found in the lesions of a disease and in situations which explain the symptoms and lesions, and which is never found except in association with the disease, must be regarded as the cause of the disease. Where, in addition to this, we are able by experiments on animals to reproduce the disease by inoculation of pure culture, this additional proof is most welcome. But in many infectious diseases we cannot furnish this last method of proof, either because we have not been able to isolate and cultivate the suspected organism, as is the case with relapsing fever, or because animals available for experiment are not susceptible to the disease, as seems to be true of typhoid fever and cholera. For this reason Koch has stated that it is not absolutely necessary that we reproduce the disease experimentally in animals by inoculation before we admit that a given organism found associated with a disease under the conditions stated is the specific cause of the disease. The evidence Dr. Welch believed to be conclusive, that the typhoid bacillus is the specific cause of typhoid fever. Dr. Vaughan's emphasis of the necessity of demonstrating the chemical products of pathogenic microorganisms

before we accept their etiological significance is based upon the assumption that infectious organisms produce their disastrous effects solely by their chemical products. But this assumption is quite unwarrantable; in fact, there is reason to believe that while some pathogenic organisms act by chemical products, others do not so act.

As Dr. Vaughan himself is doubtful as to the interpretation of his experiments on dogs, Dr. Welch was not inclined to attribute to them any bearing upon the etiology of typhoid fever, without further information than we now possess. Dr. Vaughan is to be congratulated upon the isolation from the typhoid stools of a definite crystalline substance with such interesting properties, but as Dr. Vaughan himself has stated, it will be necessary to make control chemical observations with diarrhoeal and other stools not derived from typhoid patients, before the relation of this substance to typhoid fever becomes clear.

DR. VAUGHAN said that he would give his attention wholly to the criticism of Prof. Welch, who had said that the first of Koch's rules is all that is necessary in order to prove that a given germ is the cause of a disease: in other words, because Eberth's germ is found in every case of typhoid fever it must be the cause of that disease. He did not think that all the failures to induce the disease by inoculation with this germ are of any significance as to its cause. When Koch first promulgated his four rules, and pronounced that they must be complied with before the causal relation of a germ to a disease should be considered as demonstrated, the scientific accuracy of such a demonstration won the confidence of the medical world. Now, Prof. Welch says that three of these four rules are unnecessary. He claims that the presence of the Eberth germ in the altered tissue of typhoid fever is a proof that these germs cause typhoid fever. How does he know that the presence of the germ is the cause and not the result of the disease? He reaches this conclusion by reasoning from analogy. This kind of reasoning may have its value, but it is not scientific. Suppose that an inhabitant of some far-off planet should, by means of optical instruments, be able to discern the inhabitants of a certain portion of the globe. Suppose that the portion of the globe which should fall under his observation to be the frigid zone. Here he would find the inhabitants living in houses built of snow and ice, and, reasoning by analogy, he might conclude that all the inhabitants of the earth live in houses of this kind. The reasoning of Prof. Welch is just as unscientific as that in the supposed case of the planetary observer. Condensed, his reasoning would be about as follows: (1) The bacillus of consumption is found in every case of consumption, and the Eberth germ is found in every case of typhoid fever. (2) The bacillus of tuberculosis has been demonstrated to be the cause of consumption. (3) Therefore, the Eberth germ is the cause of typhoid fever.

DR. J. C. WILSON, of Philadelphia, presented a paper on

THE PROPHYLAXIS OF TUBERCULOSIS.

In it the following questions were submitted to tests for settlement: 1st. Is pulmonary consumption hereditary? 2d. Is it contagious? 3d. Is it preventable?

After thoroughly sifting all evidences offered for the first question, he affirmed that pulmonary consumption,

subjected to the tests by which we determine the question in regard to the infectious diseases in general, does not appear to be hereditary in the ordinary sense, and that the congenital predisposition to the tuberculous disease is much less general than to several other infectious diseases, notably the eruptive diseases of childhood.

As to the second question, he summed up his researches with the statement that tuberculous diseases respond in every important particular to the tests by which we determine the contagiousness of the other infectious diseases. Tuberculosis is transmitted by inoculation, by direct contact, by means of food and drink ingested; finally, by means of the respired air.

In the discussion of the third question he remarked that the chief avenues of contagion are the digestive and respiratory tracts. Tuberculosis is acquired by infected foods and by the inhalation of air containing tubercle bacilli and spores. The rigid inspection of all cows in dairies and of all animals slaughtered for food and the destruction of those found to be infected would constitute the chief measure of prophylaxis as regards infection by food. A second measure would be the systematic care of the milk until consumed.

Reduced to its simplest form, the problem of prophylaxis against the spread of the tuberculous diseases among human beings consists in the proper care of the fresh expectoration of consumptives. Not dangerous while moist, it becomes, when dried, the chief means of the spread of the disease, from the lesions of which alone it is derived. It should be collected in suitable vessels and kept in a moist condition until it has been destroyed by fire or discharged into sewers under such conditions as will insure its conveyance to places where it is not likely to become a source of danger. Spitting upon the floor, or in the streets, or into handkerchiefs or towels, should in all instances be avoided. Suitable cuspidors should be used at home and pocket spit-cups carried when without. An individual who is well on the road to recovery, may, by self-inoculation, if he do not with the greatest care destroy his sputum, diminish greatly his chances of recovery. The early recognition and treatment of pulmonary consumption constitute in themselves an important measure of prophylaxis.

DR. STOCKTON took issue with the author on one point —*i. e.*, diathesis. He quoted a case occurring in an orphan asylum, in which a single child was attacked with acute tuberculosis, while no other child was ill. Why was this so? It can be explained on no other ground except lack of resistance. It seems so evident that something beside contagion is concerned in the etiology of tuberculosis that the causes may be divided into two classes: 1st, contagion, and, 2d, non-resisting soil.

DR. SOLLY, of Colorado Springs, thought that he had observed in Colorado strong evidences of the contagious character of the disease. It was found occurring in all individuals, and attacking any one with the slightest exciting cause.

DR. HERRICK was not ready to accept absolutely the contagious character of tuberculosis. It might be a matter of mental deficiency on his part, still a large number of facts were to him not explicable.

DR. SOLIS-COHEN, of Philadelphia, said that the last speaker need not fear being accused of mental deficiency so long as one of the great medical minds of the century, Dr. B. W. Richardson, of London, occupied the same

position of wholesome scepticism. It would be a mistake to assume that the infective action of microbic parasites is the sole cause of consumption. There are other parasites—the entozoa, which descending from non-parasitic organisms have, through the circumstances attending their evolution, taken upon themselves the parasitic cycle. As Dr. Vaughan's investigation proceeds in the one direction to determine in what way bacteria are toxic, so we may look in the other direction to see which preceded chronologically, the microorganism or the disease, alike in the life of the individual and in that of the race. May we not conceive that their evolutionary history is like that of the entozoa; that, originally innocuous, they found in the degenerated tissues of disease a favorable environment, and thus took up their parasitic cycle, gaining, perhaps, a certain power of carrying infection. He did not deny their infectious power, but he did submit that the evidence of their sole power of originating disease is not conclusive. The evidence as to consumption seems to indicate an hereditary diathesis, an hereditary failure of nutrition, and that upon this bacillary tuberculosis becomes engrafted as an epiphenomenon.

DR. WILSON, in answer to Dr. Stockton's remarks, stated that there are cases of tuberculosis as incapable of explanation as some of the single cases of typhoid fever occurring in a locality. The tubercular nature of the disease is demonstrated. Those who do not accept the doctrine have nothing to offer in its place.

DR. SOLOMON SOLIS-COHEN then read a paper on

FOOD IN THE TREATMENT OF PULMONARY CONSUMPTION.

Though the paper is therapeutic, yet, as therapeusis must be founded on sound pathology, it is necessary to state that the morbid physiology of the disease, and not its bacteriology, is considered the fundamental indication. In deference to prevailing views, tuberculosis may for the present be granted to be the history of the growth, life, and activity of a bacillus. But for rational treatment we must revert to the views of Niemeyer, who said that the danger of phthisis is tuberculosis; or to those of Rush, who declared that tubercle and other anatomical lesions were "the effect, not the cause of pulmonary consumption;" and recognize the disease we have to combat not in epiphrenomena of possible microbic origin, but in the consumption, the aberration of nutrition, which precedes the entrance of the microbe. Consumption is a disease of nutrition, whose exact mechanism is as yet unknown, though the results of prolonged observation justify us in considering heredity, unhygienic surroundings, and, in general, those influences called "depressing," as among its remote or proximate causes; the pulmonary form being further dependent upon errors in respiration, whether of the substances respiration or of the performance of the act.

Thus we dismiss as futile, microbial treatment; and recognize ptomaines of bacillary origin only as giving rise to intercurrent symptoms which may call for antidotal or symptomatic treatment. Fixing attention upon the malnutrition, which is not a mere "predisposition" to succumb to a bacillus, but the essence of the whole morbid process, we combat it by direct measures, hygienic and medicinal; the latter secondary, the former all-important. Chief among hygienic measures is food.

Food consists not alone of meat and drink, but also of air. Full respiratory diet is necessary to the utilization of alimentary diet. As in diabetes, so in phthisis, there is imperfect metabolism of carbohydrates. Experience shows a nitrogenous dietary to be best. Deboe has shown that consumptives can assimilate a quantity of food far in excess of the needs of the healthy organism. This excessive quantity should be supplied; though resort to the stomach-tube, as in Deboe's experiments, can be reserved for special cases.

Meat, principally beef, with milk, fish, eggs, leguminous vegetables and greens, should form the bulk of the dietary; with the addition of fat, in large quantities, in the form of cream, butter, oil dressing for salads, or, if necessary, cod-liver oil or oleaginous inunctions. Alcohol is a food in consumption. It should be taken with malt, milk, cream, glycerine, or cod-liver oil. Not more than three, at most four, hours except during sleep, should be allowed to elapse without taking food. Milk-punch on going to bed, and a glass of wine or spirits with liquid peptonoids in case of waking during the night, were strongly urged. Hot water before meals, lavage if necessary, to prepare the alimentary tract for the digestion and absorption of increased food, and the free drinking of water to wash out waste products, are essential to success. Predigested foods may be employed with great benefit, especially peptonized milk and beef peptonoids. In case gavage is resorted to, they should be used almost exclusively. Gavage is best preceded by lavage with an alkaline solution and chloroform water.

Proper alimentary diet being secured through overfeeding, and the digestive tract and its adnexa being kept in good condition, proper respiratory diet must be supplied. Open-air life, exercise on horseback, or bicycle, voluntary respiratory gymnastics, may suffice when the patient is still strong enough. In the majority of cases there must be some artificial aid. The inhalation of compressed air, with or without expiration into rarefied air is the best means. Apparatus should be simple and cheap, so that the patient can use it at home. The principles laid down by Waldenburg are the correct ones. Cohen's apparatus consists of a bellows and a small gasometer modelled upon Waldenburg's. Its advantages are cheapness, simplicity, and small size, fitting it for home use. After patients are sufficiently advanced toward recovery, the pneumatic resistance valves of the author, a still more convenient and very cheap pocket apparatus (costing about five dollars) may be used. It may be used in the first instance with strong patients. It is also useful as a prophylactic measure with ill-developed children. It gives the effects of breathing against pressure—*i. e.*, into compressed air, or out of rarefied air.

The effects of pneumatic measures are to increase the volume of respiratory air, open up unused air-cells, facilitate expulsion of pathological products, increase gaseous exchange, facilitate absorption of oxygen by the haemoglobin, while, at the same time, the volume of blood and the activity of circulation in the lungs are increased, bringing more corpuscles into contact with the increased volume of oxygen. Penetration of blood into the tissues, tissue respiration, and production of lymph, are also increased. Thus local and general nutrition are powerfully stimulated, and an improved respiratory habit, and increased respiratory and circulatory power are gained. The products of digestion are properly oxidized and

utilized, immature tissue is destroyed and expelled. The promotion of sleep is one of the most marked effects.

The physician puts them, by altering his patients' environment in the manner described, into a condition where natural powers complete the cure, and bacilli need not be feared. Illustrative cases were cited, and the conclusion reached that the proper treatment of consumption is not microbicidic, but nutrition.

AMERICAN NEUROLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, held at Long Branch, N.J., June 26 and 27, 1889.

(Continued from page 27.)

JUNE 27TH.—MORNING SESSION.

DR. GEORGE W. JACOBY, of New York, read a paper entitled

A CONTRIBUTION TO THE STUDY OF ANÆSTHETIC LEPROSY, WITH SPECIAL REFERENCE TO PARTIAL SENSORY DISORDERS.

The points to which particular attention should be paid in all cases were, the electrical excitability of the muscles, the condition of the reflexes, the presence or absence of fibrillary twitchings, and the condition of sensation. Upon these data depended the diagnosis between anæsthetic leprosy and syringomyelia, as well as that of the central or peripheral localization of the leprous process. The conclusions arrived at by the author from the analysis of his own and other cases were, that the differential diagnosis between the two diseases could not always be made; that partial sensory disorders are not characteristic of syringomyelia, but may occur in anæsthetic leprosy as well as in purely peripheral affections; and, finally, that a differential diagnostic point between central and peripheral loss of temperature sense may lie in its complete loss in one case, and its partial in the other.

DR. STARR said that the same question as to the differential diagnosis between syringomyelia and anæsthetic leprosy had only recently occurred to him. Three weeks ago he had seen a case with Dr. Prince A. Morrow, of New York, in which there had been a gradual onset of an atrophic and anæsthetic affection of the right arm. He came from the Sandwich Islands, and had been exposed to leprosy. There was anæsthesia to temperature and pain, but not wholly to touch, along the hand and part of arm. There were three small reddish-brown spots on the arm, which Dr. Morrow considered leprous in character. The idea of syringomyelia at once occurred to him, but the history of exposure in a leprous country sufficed to make anæsthetic leprosy at least the more probable nature of the disease; but without such history it would have been almost impossible to make the diagnosis. As to the matter of partial loss of sensation, in the cases of multiple neuritis and *beri beri* he had seen, the sensory loss was complete, with the exception, however, of muscular sense.

THE PRESIDENT remarked that he had now under observation a case of leprosy, but had as yet made no careful examination of the temperature sense. His case illustrated the ease of diagnosis at an early period, when confusion with syringomyelia could not occur. The patient had a wine-colored eruption on the entire left leg and part of the thigh, the foot being free, and there were

three or four similar spots on other parts of the body. There was distinct analgesia and some anæsthesia in these areas, but there was no paralysis or atrophy. The patient had come from the Sandwich Islands. The well-defined limitation of anæsthetic areas showed that it could not be neuritis. Of late, the anterior leg muscles had become paretic, but there was no reaction of degeneration. The left hand was beginning also to manifest similar symptoms. There were no ulcers.

DR. C. K. MILLS had seen two cases of leprosy. He thought the author's point with regard to partial sensory disorder very interesting, but he did not see why there should not be partial disturbance also in neuritis, and, in fact, in traumatic neuritis it was quite frequent. The nature of the sensory disturbance depended upon the extent of the injury to the nerve. In ordinary multiple neuritis it might be true, as Dr. Starr insisted, that there was complete loss of sensation, through destruction of all the sensory fibres. He did not see, however, why the sensation to cold should not be injured as much as any. It should be borne in mind that in all infectious diseases attacking the nervous system, there was a tendency to seize upon the central as well as the peripheral portions at the same time.

DR. GRAY agreed with the last speaker as to partial sensory disorders met with at times in peripheral neuritis. He had observed it also in multiple neuritis where, for instance, there was impairment of touch and temperature sense, yet the pain was excruciating. He did not see that it was easy to diagnosticate syringomyelia, and Wichmann and Starr had given no rules for diagnosis in their pamphlets. He believed that no one had made a diagnosis of syringomyelia in life.

DR. STARR stated that Schulze had made the diagnosis in three cases, which had been substantiated by autopsy. The points for diagnosis were the general conclusions drawn from a study of collected cases. Anna Baumler had brought together one hundred and sixteen cases, to which thirty or more had since been added.

DR. GRAY thought these diagnostic points would apply to many other spinal lesions.

DR. BIRDSALL had had similar ideas to those of Dr. Gray as regarded the diagnostic indications in syringomyelia until he had read Roth's collection of cases. In a certain number of such cases there were clinical pictures differing altogether from other spinal lesions and from peripheral neuritis. Disturbance of the temperature sense was the particular characteristic. Still, the testing of this sense had been constantly neglected in studying other spinal cases, and it was possible that it might often be disturbed in other spinal disorders. It was hard to see how any other lesion could produce precisely the same symptoms as those of syringomyelia. It was a question whether tracts for temperature and pain could be localized in the cord. Peripheral nerve lesions might cause injury to some sense fibres and not to others, although generally all are injured, particularly where the inflammation is truncal in character. There might be partial sensory disturbance in dermal forms.

DR. GRAY said it was easy to localize disease in the anterior cornua, in the lateral and posterior columns of the cord, but the diagnosis of central lesions was very difficult. The fact that out of one hundred and fifty cases of syringomyelia only three had been diagnosed during life proved the truth of his assertion. The

diagnostic suggestions given were, therefore, empirical. The presence or absence of temperature sense had not been sufficiently tested as yet. How would one distinguish a chronic central myelitis?

DR. BIRDSALL stated that central myelitis began acutely and thus differed from the slow advance of syringomyelia.

DR. MILLS thought the question of partial sensory disorder most interesting. But he thought that there would be more apt to be partial disturbance in a trunical neuritis than in a dermal.

DR. PETERSON asked the President if the tendon reflexes were exaggerated in his case of leprosy, and was answered in the affirmative. He had asked this because he had recently read an interesting study of the reflexes in anaesthetic leprosy made by Dr. Suzuki, of Tōkyō, and published in the *Sei-I-Kwai Medical Journal*, in which there was an analysis of seventeen cases. One had normal reflexes, while all the others had increased tendon jerks, and in some of the cases there was even ankle-clonus. The conclusions arrived at by the author were similar to those of Dr. Jacoby.

The PRESIDENT called attention to the fact that so many cases of leprosy were now being continually imported into the United States. It seemed as if the country were threatened with its domiciliation. It was a question whether it was not the duty of physicians having such cases to report them to the authorities.

DR. SINKLER mentioned the recent presence of two cases in Philadelphia. The physician in charge had been fined by the Board of Health for not reporting them.

DR. PRINCE wondered at the manner in which leprous patients were allowed to go about, and thought also that the attention of the authorities ought to be called to the disease, and reports to the Boards of Health ought to be required.

DR. GRAY knew that in the East where the disease is prevalent, isolation is practised. He wished to know what the actual danger of contagion was.

DR. BRILL said that the attention of the New York Board of Health had already been called to the matter.

DR. JACOBY, in closing the discussion, said that Schulze was altogether too positive in his assertions. This author went so far as to contend that cases of leprosy where cavities had been found in the cord were not leprosy at all but syringomyelia. As for himself, he thought a central lesion probably often exists in this disease, although it is well known that the essential pathology lies in a trunical neuritis. A simple dermal neuritis could not be assumed in leprosy. In his case, for instance, the indurated and swollen ulnar nerve could be distinctly felt. He did not agree with Dr. Gray that the diagnosis of syringomyelia could not be made. The only danger lay in mistaking it for leprosy. He had, only last evening, come across a work of Suzuki mentioned by Dr. Peterson, and had noticed the identity of the conclusions of that author with his own, although they were reached from different points of view.

DR. F. X. DERCUM, of Philadelphia, then presented two contributions entitled, respectively,

A DESCRIPTION OF TWO CHINESE BRAINS and

A NOTE ON THE PLI DE PASSAGE INFÉRIEURE INTERNE IN THE HUMAN BRAIN.

He exhibited the brains described. Dr. Mills had made a morphological analysis of one in 1886, and descriptions of three Chinese brains had been added to literature by Moritz Benedikt. The six brains thus far analyzed exhibited unusual complexity due to excessive sinuosity of the gyri, and a tendency to excessive transverse fissuration. The frontal lobes were especially large and complex. There was unusual confluence of fissures indicative of a low degree of development, such as is often seen in the negro's and sometimes in the white man's brain. There was unusual length of the parallel and Sylvian fissures, and eversion of the orbital and temporal lobes.

DR. MILLS said that it was very important to keep adding to our morphological descriptions of such brains, until accurate deductions could be drawn from a very large number.

DR. SPITZKA stated that the dictum that a tendency to confluence of fissures indicated a low type of development was not accepted by most anthropologists. The more brachycephalic the skull, the greater was the development of transverse secondary folds. The elephant, which stands among the highest of mammals, has a broad skull and a tendency to confluence of fissures. The Chinese were not low in development. The internal pli de passage in the negro and idiot was significant only when the general cortical development was poor. The real cause of the location of the chief sulci lay in the inherent architecture of the brain, and was due to the arrangement of groups of cells and fibres, but the secondary and tertiary sulci might be influenced by other factors, such as the course of vessels. While we might never be able to localize the higher functions of the mind, there was something in the physiognomy of the Chinese brain which struck him as differing altogether from that of the Caucasian. But it was not the same difference as was noticeable between the negro and Caucasian brains. The peculiar moral attitude of the Chinese pointed to some relation between the structure of their brains and the character of their minds. Still, he had observed a great difference between these two Chinese brains, and there was no feature in them which might not be reproduced in the Caucasian brain.

DR. DERCUM had not wished to imply that transverse fissuration was indicative of a low type, but thought the unusual confluence showed a lack of cortical development. He did not consider them brains of a low type, but many features such as were found in the brains of the negro and ape were found here also. The excessive sinuosity, however, indicated a higher cortical development. For instance, in one brain there were five well-developed frontal gyri.

DR. SPITZKA had the same idea as Dr. Dercum. As compared with the Caucasian brain, the Chinese was in some respects inferior, and in others exhibited a superabundance of gyri. He spoke of the resemblance between the negro and ape brains. The differences between the brains of the orang-outang and chimpanzee were greater than those between the brains of the chimpanzee and a human being. There was no uniform appearance of the ape's brain. Voigt and another had classified the human brain into three types: the Negro, Mongolian, and Caucasian, corresponding somewhat to the three lower types of the gorilla, chimpanzee, and orang-outang.

DR. M. ALLEN STARR, of New York, then read a paper entitled

THE PATHOLOGY OF SENSORY APHASIA, WITH AN ANALYSIS OF FIFTY CASES IN WHICH BROCA'S CENTRE WAS NOT DISEASED.

In all of these cases collected by the author some form of sensory aphasia was present, and in all the lesion lay in the posterior lower third of the brain. In seven of the cases there was pure word-deafness, and in these the lesion was limited to the posterior portion of the first and second temporal convolutions. In eleven cases there was pure word-blindness, and in these the lesions were found distributed either in the angular gyrus, the occipital lobe, the temporal convolutions, or the inferior parietal region.

In seven cases word-deafness and word-blindness were coexistent, although the use of language was not lost; and in these the temporal convolutions were involved, extending in some to the inferior parietal, angular, and occipital convolutions. The practical application of the localization of aphasia lesions is obvious, for the regions concerned in speech are especially accessible to the surgeon.

Another fact of interest is, that it seems to be proven that there is no ideational centre. Any idea may be impaired, but cannot be wholly destroyed, by a single cortical lesion. Thought being regarded as the play of consciousness along association fibres between sensory centres cannot be localized.

DR. LLOYD had now a case of simple homonymous hemianopsia without psychical or word-blindness, and wished to know whether there was any diagnostic importance in this condition as to localization. Was there a preponderance of one hemisphere over another as regarded sensory memories of language?

DR. STARR said that the matter of psychical blindness had recently been discussed by Wernicke and another. A lesion affecting bilaterally both occipital lobes or the association tract produces psychical blindness, but a lesion along either tract itself does not cause this condition. Nine cases of psychical blindness from lesion of one hemisphere alone had been reported.

THE ELECTION OF OFFICERS FOR THE ENSUING YEAR
being then in order, the following were chosen:

President.—Dr. E. C. Spitzka, of New York.

Vice-Presidents.—Dr. Wharton Sinkler, of Philadelphia; Dr. H. M. Lyman, of Chicago.

Secretary and Treasurer.—Dr. G. M. Hammond, of New York.

Councillors.—Dr. Henry Hun, of Albany; Dr. C. L. Dana, of New York.

(To be concluded.)

NEWS ITEMS.

An International Courtesy.—Under this heading the *British Medical Journal* of July 6th contains the following editorial:

DR. BILLINGS, the accomplished American physician, whose address at the International Medical Congress in London excited much admiration, and whose works are well known and greatly esteemed by all of us, has re-

cently passed through London—where he has been the guest for a few days of Dr. Ord—on his way to Oxford, to receive there the distinction of an honorary degree in law at the annual encænia. Being charged with the preparation of the forthcoming census of the United States he could make but a brief stay, and is already on his way home, otherwise we might have hoped to have seen him at our London meeting.

Few could have deserved this new honor better. Dr. Billings is still a comparatively young man when the work which he has done, the position which he fills, and the honors which he has obtained are considered. He was born in Indiana in the year 1838. He took his degree of M.A. at Miami University, Ohio, and the degree of M.D. at Cincinnati, Ohio, in the year 1860. In the next year the war of secession broke out, and he entered the Federal military service. His energy and abilities at once marked him as a man to whom serious responsibilities should be entrusted. He was Medical Inspector of the Army of the Potomac in 1863 and 1864. He served with the Federal army in the field, being present at the battles of Chancellorsville and Gettysburg, and subsequently took part in General Grant's fighting in Virginia. His talent for organization found ample field in the development of the great field hospitals, with their thousands of wounded and sick. After the war he and others were occupied in creating that monumental record—the great *Medical and Surgical History of the War of the Rebellion*. This work could only be accomplished with the aid of the Government, and this was dispensed to Dr. Billings and his colleagues with a generosity which has enabled them to produce a work than which none other of like magnitude, completeness, and merit exists. It will prove for many years to come, as it has already proved, a treasure-house of information.

A work not less important, and perhaps more after his own heart, has been the making of the Army Medical Museum and Library, at Washington. The museum is really a wonderful thing for its age, both from the quantity and quality of the material arranged in it. It has been now transferred from the old threathre building in which Lincoln was murdered to the palatial structure on the shore of the Potomac, specially built for it under Dr. Billings's direction. Here, too, the wise liberality of the Government is displayed in the completeness of the arrangements and the great expenditure they have entailed. Here, too, are many rooms where, under the supervision of its head, much good work is being accomplished.

It is, we believe not too much to say that the library of the Army Medical Department is the largest and most complete medical library in the world. It, likewise, owes its development to the fostering care of Dr. Billings. It contains not only all the best modern books and periodicals in every language, but a collection of the classic works of every kind connected with medical knowledge of our forefathers in scientific work. Not only is it free to everyone to enter, but to any part of the great United States books from this library are forwarded on application to any duly qualified man. The losses which this entails are stated to be infinitesimal. The crown has recently been placed on another great work fostered by Dr. Billings in the opening of the Johns Hopkins Hospital at Baltimore, built from his plans and under his supervision, an account of which he recently published.

No expense has been spared in the successful attempt to make this the most perfect of modern hospitals.

Amid all this primary official work he has found time for other offices and for the production of books. He has been Vice-President of the National Board of Health. He had charge of the vital statistics of the tenth census, bringing out a report in two large volumes. He has also charge of the vital and mortality and social statistics of cities for the approaching census of the United States.

With all this important occupation Dr. Billings's official rank is less high than is generally supposed in this country. He is Major and Lieutenant-Colonel and Surgeon in the United States Army.

Dr. Billings has also done great service to the whole of the medical profession by his *Index Medicus*, begun in 1879, and still in regular publication. He is now preparing a large dictionary of medical terms, in two volumes, which is to appear speedily.

With such a record, it is not to be wondered that the University of Oxford, wherein all that Dr. Billings has done is well known to Sir Henry Acland, should have deemed him worthy of the high honor of its D.C.L., thus adding his name to those of Owen, Alison, Brodie, Milne Edwards, Van der Hoeven, Christison, Stokes, Jenner, Gross, Paget, Lister, Allen Thomson, William Farr, Simon, and others to whom she has given in the last few years her highest degree. Besides this honor, he already holds the honorary degrees of LL.D. Harvard, LL.D. Edinburgh, and M.D. Munich, and he is a member of the National Academy of Sciences in America, which may be in many respects compared to our Royal Society.

How various are the ways by which scientific medicine is being advanced is plain enough to our readers. It is pleasant to think that the United States are advancing along the whole line of knowledge. It is of no small moment that Washington, but lately only a political capital, is becoming a centre of scientific biological effort, through the rapidly expanding National Museum, and the labors of Dr. Billings in the War Office. The probable effects cannot easily be overestimated. The problem of the future of the United States is one of the most interesting, as well as the newest, in the history of the human family. The modern appliances for material growth there seen have never in history been so rapidly developed, and we are glad that a firm grasp is likely to be taken by our American brethren of all of the circumstances that effect the progress of scientific, curative, and preventive medicine.

The Archduke Carl Theodor of Bavaria has been dangerously ill with lymphangitis of the arm and axilla, following inflammation of the hand, due, it is supposed, either to the sting of an insect or to a wound received during an operation. His Highness has now recovered sufficiently to resume surgical practice at Meran.—*British Med. Journal*, June 22, 1889.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM JULY 2 TO JULY 15, 1889.

GIBSON, R. J., *Captain and Assistant Surgeon*.—Reports arrival, July 2, 1889, at Camp Lewis, Fisher's Island, New York,

in compliance with Par. 5, S. O. 133, Division of the Atlantic, which designated him as Medical Officer for the encampment (rifle practice) at Fisher's Island, New York.

GORGAS, W. C., *Captain and Assistant Surgeon*.—Is granted leave of absence for one month, to take effect on the arrival of a medical officer to relieve him.—Par. 2, S. O. 84, *Headquarters Department of the Missouri*, July 3, 1889.

By direction of the Secretary of War, ANDREW V. CHERBONIER, *Captain and Medical Storekeeper*, will, in addition to his present duties, take charge of the office and perform the duties of Acting Assistant Medical Purveyor in St. Louis, Missouri, during the absence of Captain George T. Beall, *Medical Storekeeper*.—Par. 2, S. O. 157, A. G. O., July 2, 1889.

By direction of the Acting Secretary of War, the retirement from active service this date, by operation of law, of THOMAS A. MCPARLIN, *Colonel and Surgeon*, under the provisions of the Act of Congress approved June 30, 1882, is announced. Colonel McParlin will repair to his home.—Par. 2, S. O. 157, A. G. O., July 10, 1889.

TOWN, FRANCIS L., *Lieutenant-Colonel and Surgeon*.—Promoted Surgeon, with rank of Lieutenant-Colonel, to rank from July 10, 1889, vice A. K. Smith, promoted.

SMITH, ANDREW K., *Colonel and Surgeon*.—Promoted Surgeon, with rank of Colonel, to rank from July 10, 1889, vice McParlin, retired.

PERLEY, H. O., *Captain and Assistant Surgeon*.—Is ordered to accompany troops from Fort Wayne, Michigan, to Gogna Lake, Michigan, to encamp there with the Michigan State troops, from August 8 to 13, 1889.—Par. 1, S. O. 154, *Headquarters Division of the Atlantic*, July 9, 1889.

PERLEY, H. O., *Captain and Assistant Surgeon*.—Is granted fourteen days leave of absence, to commence about July 14, 1889.—Par. 2, S. O. 154, *Headquarters Department of the Atlantic*, July 9, 1889.

BRECHMIN, LOUIS, *Captain and Assistant Surgeon*.—Ordered to the Illinois National Guard, near Springfield, Illinois, during the remaining portion of the encampment.—Par. 1, S. O. 159, A. G. O., July 12, 1889.

BALL, R. R., *First Lieutenant and Assistant Surgeon*.—Is granted leave of absence for fifteen days.—Par. 3, S. O. 87, *Department of the Missouri*, July 9, 1889.

INES, F. J., *Assistant Surgeon*.—Now at Fort Lyon, Colorado, will proceed to camp near Oklahoma City, Indian Territory, and report to the commanding officer for duty, relieving W. C. Gorgas, Captain and Assistant Surgeon, who, when so relieved, is authorized to avail himself of the leave of absence granted him in Par. 2, S. O. 84, c. t., *Department of the Missouri*.—Par. 1, S. O. 87, *Department of the Missouri*, July 9, 1889.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY, FOR THE TWO WEEKS ENDING JULY 13, 1889.

WHITE, S. STUART, *Assistant Surgeon*.—Ordered to the Naval Hospital, Brooklyn, New York.

WHITE, C. H., *Medical Inspector*.—Detached from the "Trenton," and wait orders.

NORFLEET, ERNEST, *Passed Assistant Surgeon*.—Detached from the "Trenton," and ordered to the "Monocacy."

AMES, H. E., *Passed Assistant Surgeon*.—Detached from the "Monocacy," proceed home, and wait orders.

HARMON, G. E. H., *Surgeon*.—Detached from the "Constellation," and ordered to the Naval Academy.

LOWNDES, C. H. T., *Assistant Surgeon*.—Detached from the "Constellation," and ordered to the Naval Academy.

HARVEY, H. P., *Surgeon*.—Detached from the "Vandalia" July 7th, proceed home, and wait orders.

WHITE, S. STUART, *Assistant Surgeon*.—Detached from the "Trenton" July 7, 1889.

 *THE MEDICAL NEWS* will be pleased to receive early intelligence of local events of general medical interest, or of matters which it is desirable to bring to the notice of the profession.

Local papers containing reports or news items should be marked. Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course not necessarily for publication.

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